Islamic Republic of Iran
Health Sector Review

Volume II: Background Sections

June 2008

The World Bank Group
Human Development Sector
Middle East and North Africa

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<th>Name</th>
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<tr>
<td>Vice President</td>
<td>Daniela Gressani</td>
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<tr>
<td>Country Director</td>
<td>Hedi Larbi</td>
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<tr>
<td>Lead Economist</td>
<td>Habib Fetini</td>
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<td>Sector Director</td>
<td>Steen Lau Jorgensen</td>
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<tr>
<td>Sector Manager</td>
<td>Akiko Maeda</td>
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<tr>
<td>Task Team Leader</td>
<td>John Langenbrunner</td>
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</tbody>
</table>
## Currency Equivalents

**Currency Unit:** Iranian Rials (Rls)

**Exchange Rate:** USD 1 = Rls 9,275

*Effective as of June 26, 2007*

## List of Acronyms and Abbreviations

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<tr>
<td>AFMSO</td>
<td>Armed Forces Medical Services Organization</td>
</tr>
<tr>
<td>ALOS</td>
<td>Average Length of Stay</td>
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<tr>
<td>ART</td>
<td>Anti-Retro Viral Therapy</td>
</tr>
<tr>
<td>BMI</td>
<td>Body Mass Index</td>
</tr>
<tr>
<td>BOP</td>
<td>Balance of Payments</td>
</tr>
<tr>
<td>BOR</td>
<td>Bed Occupancy Rate</td>
</tr>
<tr>
<td>CARMEN</td>
<td>Multifaceted Reduction for Non-communicable Diseases</td>
</tr>
<tr>
<td>CCU</td>
<td>Critical Care Unit</td>
</tr>
<tr>
<td>CDC</td>
<td>Centers for Disease Control</td>
</tr>
<tr>
<td>CHD</td>
<td>Coronary Heart Disease</td>
</tr>
<tr>
<td>CINDI</td>
<td>Countrywide Integrated Non-communicable Disease Intervention</td>
</tr>
<tr>
<td>CIS</td>
<td>Clinic Information System</td>
</tr>
<tr>
<td>CPI</td>
<td>Consumer Price Index</td>
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<tr>
<td>CQI</td>
<td>Continuous Quality Improvement</td>
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<tr>
<td>CSR</td>
<td>Central Sterilization Room</td>
</tr>
<tr>
<td>CVA</td>
<td>Cerebral Vascular Accidents</td>
</tr>
<tr>
<td>CVD</td>
<td>Cardiovascular Disease</td>
</tr>
<tr>
<td>DALY</td>
<td>Disability-Adjusted Life Years</td>
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<tr>
<td>DGSHI</td>
<td>Director General for Statistics and Health Information</td>
</tr>
<tr>
<td>DHC</td>
<td>District Health Centers</td>
</tr>
<tr>
<td>DHS</td>
<td>Demographic and Health Survey</td>
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<tr>
<td>DMLMD</td>
<td>Deputy Minister for Logistics and Management Development</td>
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<tr>
<td>DRG</td>
<td>Diagnosis-Related Group</td>
</tr>
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<td>DSM</td>
<td>Diagnostic and Statistical Manual of Mental Disorders</td>
</tr>
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<td>EES</td>
<td>Electronic Encounter Summary</td>
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<tr>
<td>EHIF</td>
<td>Estonian Health Insurance Fund</td>
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<td>EMRO</td>
<td>Regional Office for the Eastern Mediterranean</td>
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<td>EMSP</td>
<td>Environmental Management Support Project</td>
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<td>FCTC</td>
<td>Framework Convention on Tobacco Control</td>
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<td>FFS</td>
<td>Fee for Service</td>
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<tr>
<td>FM</td>
<td>Family Medicine</td>
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<td>FMI</td>
<td>Financial Management Information System</td>
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<td>FONASA</td>
<td>National Health Fund</td>
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<td>FP</td>
<td>Family Practitioner</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GNI</td>
<td>Gross National Income</td>
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<td>GP</td>
<td>General Practice</td>
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<td>HAART</td>
<td>Highly Active Anti-Retroviral Therapy</td>
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<td>HIES</td>
<td>Household Income and Expenditure Survey</td>
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<td>HIHC</td>
<td>Health Insurance High Council</td>
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<td>HIS</td>
<td>Hospital Information System</td>
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<td>HMIS</td>
<td>Health Management Information System</td>
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<td>HNIS</td>
<td>Health Network Information Software</td>
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<td>HR</td>
<td>Human Resources</td>
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<tr>
<td>HSR</td>
<td>Health Sector Review</td>
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<tr>
<td>ICD</td>
<td>International Classification of Diseases</td>
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<td>ICU</td>
<td>Intensive Care Unit</td>
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<tr>
<td>IDU</td>
<td>Injecting Drug Users</td>
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<td>IFFC</td>
<td>Index of Fairness of Financial Contribution</td>
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<td>IKF</td>
<td>Imam Khomeini Foundation</td>
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<tr>
<td>ILI</td>
<td>Influenza-Like-Illness</td>
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<tr>
<td>IMR</td>
<td>Infant Mortality Rate</td>
</tr>
<tr>
<td>INF</td>
<td>Iran National Formulary</td>
</tr>
<tr>
<td>INHDD</td>
<td>Iranian National Health Data Dictionary</td>
</tr>
<tr>
<td>IPR</td>
<td>International Property Rights</td>
</tr>
<tr>
<td>IRIMC</td>
<td>Islamic Republic of Iran Medical Council</td>
</tr>
<tr>
<td>JICA</td>
<td>Japanese International Cooperation Agency</td>
</tr>
<tr>
<td>M&amp;E</td>
<td>Monitoring and Evaluation</td>
</tr>
<tr>
<td>MDGs</td>
<td>Millennium Development Goals</td>
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<tr>
<td>MENA</td>
<td>Middle East and North Africa</td>
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<tr>
<td>MIS</td>
<td>Management Information System</td>
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<tr>
<td>MMR</td>
<td>Maternal Mortality Ratio</td>
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<tr>
<td>MOHME</td>
<td>Ministry of Health and Medical Education</td>
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<tr>
<td>MPO</td>
<td>Management and Planning Organization</td>
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<tr>
<td>MRI</td>
<td>Magnetic Resonance Imaging</td>
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<td>MSISO</td>
<td>Medical Services Insurance Organization</td>
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<td>MTA</td>
<td>Medical Technology Assessment</td>
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<td>NCDs</td>
<td>Non-communicable Diseases</td>
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<td>NGO</td>
<td>Non-Governmental Organization</td>
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<td>NHA</td>
<td>National Health Account</td>
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<td>NIC</td>
<td>National Influenza Center</td>
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<td>NMS</td>
<td>National Micronutrient Survey</td>
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<tr>
<td>OECD</td>
<td>Organization for Economic Co-operation and Development</td>
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<tr>
<td>OOPs</td>
<td>Out-of-Pocket Payments</td>
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<tr>
<td>OTC</td>
<td>Over-the-Counter</td>
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<tr>
<td>PCG</td>
<td>Primary Care Group</td>
</tr>
<tr>
<td>PCT</td>
<td>Primary Care Trust</td>
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<tr>
<td>PHC</td>
<td>Primary Health Care</td>
</tr>
<tr>
<td>PMTCT</td>
<td>Prevention of Mother-to-Child Transmission</td>
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<tr>
<td>PPF</td>
<td>Public Purchasing Fund</td>
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<tr>
<td>PPP</td>
<td>Purchasing Power Parity</td>
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<tr>
<td>RAWP</td>
<td>Resource Allocation Working Party</td>
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<tr>
<td>RHC</td>
<td>Rural Health Center</td>
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<tr>
<td>RHH</td>
<td>Rural Health House</td>
</tr>
<tr>
<td>SSO</td>
<td>Social Security Organization</td>
</tr>
<tr>
<td>STIs</td>
<td>Sexually Transmitted Infections</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>UHC</td>
<td>Urban Health Centers</td>
</tr>
<tr>
<td>UHP</td>
<td>Urban Health Posts</td>
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<td>UMSHS</td>
<td>Universities of Medical Sciences and Health Services</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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<tr>
<td>UNFPA</td>
<td>United Nations Population Fund</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations International Children’s Emergency Fund</td>
</tr>
<tr>
<td>VH</td>
<td>Vital Horoscope</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>YLD</td>
<td>Years Lost to Disabilities</td>
</tr>
<tr>
<td>YLL</td>
<td>Years Lost of Life</td>
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"Digital Hospital” in Shahrud (2002)


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Why this Health Sector Review?
Background, Rationale and Methods

Health and the Islamic Republic of Iran

The Islamic Republic of Iran is in the midst of a significant transition in the population and health status of its citizenry. For over two and one-half decades, the country has witnessed great progress in the development of its health sector and in the accompanying improvement in health status (Table 1-1).

Table 1-1: Health Infrastructure, Health Services, and Health Outcomes

<table>
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<tr>
<th>Health Infrastructure</th>
<th>1986</th>
<th>2004/5</th>
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<tr>
<td>Total operating hospitals</td>
<td>592</td>
<td>750*</td>
</tr>
<tr>
<td>Total hospital beds (installed)</td>
<td>72,321</td>
<td>113,244*</td>
</tr>
<tr>
<td>Total physicians (MOHME only)</td>
<td>10,944</td>
<td>24,661</td>
</tr>
<tr>
<td>Total pharmacies</td>
<td>2,359</td>
<td>6,380</td>
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<td>Total number of health houses (rural areas)</td>
<td>14,149</td>
<td>16,314</td>
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<tr>
<th>Per 1,000 Population</th>
<th>1986</th>
<th>2004/5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital beds (installed)</td>
<td>1.48</td>
<td>1.66*</td>
</tr>
<tr>
<td>Physicians (MOHME only)</td>
<td>0.22</td>
<td>0.37</td>
</tr>
<tr>
<td>Pharmacies</td>
<td>0.05</td>
<td>0.09</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Immunization Coverage</th>
<th>1980</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles (% of children 12–23 months)</td>
<td>36</td>
<td>96</td>
</tr>
<tr>
<td>Diphtheria, tetanus, and polio (% of children 12–23 months)</td>
<td>32</td>
<td>99</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Health Outcomes</th>
<th>1980</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant mortality (per 1,000 live births)</td>
<td>92</td>
<td>32</td>
</tr>
<tr>
<td>Under-five years mortality (per 1,000 live births)</td>
<td>130</td>
<td>38</td>
</tr>
<tr>
<td>Adult mortality, male (per 1,000 adults)</td>
<td>221</td>
<td>166**</td>
</tr>
<tr>
<td>Adult mortality, female (per 1,000 adults)</td>
<td>190</td>
<td>114**</td>
</tr>
<tr>
<td>Life expectancy at birth (years)</td>
<td>59</td>
<td>71</td>
</tr>
<tr>
<td>MENA regional average</td>
<td>58</td>
<td>69</td>
</tr>
</tbody>
</table>

Source: MOHME (2005); WDI (2006).
* Figures for 2005; ** Figures for 2002.

The Islamic Republic of Iran is generally on track to meet the health components of the Millennium Development Goals. Successful population policies have contributed to significant reductions in the total fertility rate, yet the country is now in the midst of a demographic transition, with high rates of youth in their teens and twenties. Over time, the relative reductions in younger populations and substantially
increased numbers of older groups will have impacts on the labor markets and social policies. As well, it can be expected to change the epidemiologic profile and burden of disease in the country.

Increased urbanization and lifestyle changes have meant that obesity is on the rise, along with tobacco smoking, substance abuse, and other risk factors associated with chronic diseases. Injuries from road accidents and diseases from environmental degradation also are rising quickly. These changes in the epidemiologic profile of the population are bringing about profound changes in the nature of demand for health services and the type of health services that are needed. The main causes of death today are cardiovascular disease and cancer, although the emergence of HIV/AIDS and tuberculosis among youth groups and vulnerable groups are gaining significance. The threat of a potential outbreak of Highly Pathogenic Avian Influenza still looms.

The current burden of disease data reflects both a demographic shift and a rapid epidemiological transition that IR Iran is presently undergoing; however, the persistence of communicable diseases as well as the emergence and re-emergence of infectious diseases present IR Iran with a “double burden” of disease. This double burden of disease serves as a challenge to the health system, which must adapt in order to address both issues. These issues are addressed in more detail in subsequent sections.

Health and the Macroeconomic Context

While the Islamic Republic of Iran is also undergoing a period of high economic growth, it has not always been accompanied by high rates of job creation and declines in overall unemployment. As it moves to a more modern macroeconomic context, most new jobs will need to be created by the private sector, mainly in the service sector, as the share of domestic and foreign private investment increases. That being said, the country has experienced uneven and fragile progress and currently is facing rapidly rising health care costs, which increase the cost of outputs and affect productivity.

Health is a potential growth sector and likely to expand as a large share of the country’s economy. In order to ensure high returns on the investment and to strengthen the linkage with economic growth, the sector needs to be well regulated and managed. The health sector in the IR Iran has not yet been able to gain as much return as possible from its investment. Furthermore, the pace of reforms in the public health sector remains slow, even though labor demand in the public sector is slowing. All of this is compounded by a market place with a dominant player that acts as a drag to the country’s overall reform process.

There is an emergent private sector within the health sector in IR Iran, as perhaps a response to demand for greater client satisfaction and quality of services. However, the private sector is largely unregulated and not fully integrated. This may be, in part, due to the predominant role played by the public sector in both financing and provision of health services, but it also reflects the technical and institutional complexities involved with the development of a modern health care sector. The pharmaceutical industry is a prominent example. After the Islamic Revolution, the new leaders expropriated the holdings of the old owners and the state took over the industry. More recently, policy turned back toward the introduction of market mechanisms, private ownership or “corporatization” of publicly owned companies, favoring of branded generics, and allowing companies to market their products in competition with each other. But obstacles remain, and needed foreign investment to modernize and improve competitiveness is slow in realization.

The Islamic Republic of Iran has the opportunity to use the current economic growth cycle to advance a reform agenda, and the health sector presents one such opportunity. Health reform could further improve efficiency and improve outcomes, leading to further economic growth and development. Strong cross-country correlations between aggregate measures of health, such as life expectancy or child mortality, and
per capita income are well established. The recent Macroeconomics Commission on Health (2002) found that a 10 percent increase in life expectancy at birth leads to a 0.35 percent increase in the economic growth rate. Lagging health outcomes add to lowered productivity, e.g., in terms of sick leaves, absenteeism, and improving outputs. Investments in health (along with education) are essential for labor productivity. Weil (2001) estimated the relationship between health and labor productivity using the population’s adult survival rate (ASR) and found that workers in a low mortality country are about 68 percent more productive than workers in a higher mortality country, and estimates that about 17 percent of the variation in output per worker across countries can be attributed to health differentials. This compares with physical capital, which is estimated to account for 18 percent of the variation, and education, 21 percent. Sala-i-Martin (1997) and Stiglitz (2002) also found that initial health and investments in health are robust predictors of subsequent economic growth.

The government and the health sector leadership have launched a series of innovations and new pilot programs in the recent past. Three years ago, a new Rural Health Insurance program was passed into law, extending new benefits to over 20 million citizens. The primary care services program is being upgraded to include more general practitioners. Management autonomy pilot programs have been initiated in hospitals; facility services are being outsourced to improve cost-effectiveness. Insurers are increasingly contracting to private sector providers for services. How well are these innovations and pilot programs working, and what has been the evidence on the impacts of these new programs on efficiency, equity, access, and quality? Are these measures enough or will more change be needed?

This Study

The Government of the Islamic Republic of Iran has stated its commitment to improving the health and nutritional status of the population as articulated in the Interim Country Assistance Strategy (CAS), which lists as priorities addressing nutritional deficiencies, expanding coverage of basic health services, and improving efficiency of the health system and the quality of service at all levels. This Health Sector Review is consistent with this in that it provides the platform and evidence base for such reform. It is also in-line with part three of the current Fourth Five-Year Plan, which includes health development, human security and social justice priority, the reduction of illness from malnutrition, increasing public health service coverage, and increasing access to quality health services while reducing the financial burden on the families.

Coordination with Ongoing Activities

The ongoing Second Primary Health and Nutrition Project focused on improving health conditions through sustaining the access to and quality of primary health care, and improving the nutritional status of children less than two years old, and of pregnant and lactating women. This project included technical assistance support to the MOHME in the preparation of the National Health Sector Review and cofinanced a number of local studies that provided the background for the current study.

This study builds on previous studies carried out by the WHO-EMRO Health Systems Profile on IR Iran (2006) and the World Bank study on Health Financing Reform in IR Iran (1999). It also benefited from an inter-regional consultation, which took place in April 2006, to address the emerging public health problems of drug abuse and HIV/AIDS.

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1 ASR is defined as proportion of 15 year olds who would live to age 60 at current mortality rates.
Study Objective

The objective of this study is to provide a comprehensive review and diagnostic of the performance of the health sector in the Islamic Republic of Iran. The government is quite advanced in the type of analysis it already undertakes on various aspects of the sector (e.g., burden of diseases, national health accounts, and utilization analysis). However, a consolidation of this information and analysis that encompasses several major elements of the health sector has not been done recently.

The health sector review, through a synthesis of available data and other information on the health sector attempts to (i) assess the strengths, challenges, and opportunities facing the current health system; (ii) offer analytic assessments of the health policies and plans; and (iii) provide a framework for developing strategic options as well as short- and medium-term recommendations and action plans to achieve the goals identified in the country’s Fourth Five-Year Plan. The Review is also intended to provide a platform for discussions on possible areas of collaboration between the Government of the Islamic Republic of Iran and the World Bank on the health sector.

Who is the Audience?

The primary audience for this report will be senior officials of the Ministry of Health and Medical Education (MOHME), the medical universities, other academic and research institutions, the National Planning Commission, the Ministry of Economic Affairs and Finance, and the Management and Planning Organization. The dissemination strategy will involve a series of activities: dissemination and review workshops organized according to the key areas in the report and also regionally, beginning in July 2007, a national conference on the health sector will be organized by the MOHME, bringing together key officials and stakeholders.

Methodology and Scope

This review has been prepared in close collaboration with key counterparts from the Government of the Islamic Republic of Iran. Each member of the World Bank team has worked with a team of counterparts from the Government of the Islamic Republic of Iran since Spring/Summer 2006 to discuss the scope of the review and next steps. Detailed outlines were developed and agreed.

Because of limited time and resources, both Bank management and Government counterparts requested the joint Government–Bank team review areas in the sector of special interest and current priority. This list of priority topics included:

- Primary care;
- Secondary services including hospitals;
- Financing and resource allocation;
- Pharmaceuticals; and
- Health management information systems.

The Health Sector Review (HSR) efforts and analysis reflects these priority areas. In the Fall of 2006, the Bank team circulated a series of five policy notes in each of these topic areas to counterparts. The policy notes were short, each being 10–25 pages, and were intended to provide quick policy review for early analysis of the sector, including first discussions and meetings. Iranian and Bank counterparts utilized
these policy notes to hold workshops, engage in more intensive dialogue, and receive early feedback. Later analysis in this draft builds on this work.

A systematic review, synthesis, and analysis of existing data, surveys, documents, regulatory and budget documents, peer reviewed publications, and reviews across the sector has been the principal study methodology for the HSR. Site visits to health care centers, clinics, hospitals, prisons, insurers, pharmaceutical sites, labs, and other programs in urban and rural areas have been made available by Iranian experts and counterparts.

The HSR has developed a database related to: (i) macroeconomic indicators; (ii) demographic data; (iii) health expenditures; (iv) utilization; and (v) infrastructure for the last five to 10 years, and as available for the last 30 years – nationally, by region and local community. Iranian experts have worked with the Bank team to provide data and perform preliminary analytic tasks to support the overall sector review analysis.

Structure and Outline of the Report

This Health Sector Review has been drafted in two companion volumes. Volume I is the main report for policy makers. It is a synthesis of key issues, findings, and recommendations. This volume, Volume II, provides background papers, which are structured around topics of importance in the sector.

In this volume, the remaining sections are as follows. Section 2 provides an overview of the macroeconomic and political context as well as trends in poverty; it also briefly looks at government policies and recent reforms. The current Fourth Five-Year Plan is discussed, followed by an overview of social, demographic, and human development indicators, health status and epidemiological profile, and achievements in relation to the Millennium Development Goals (MDGs). The organization and structure of the health sector is reviewed, including historic background and development, organizational overview of the public, private, and NGO sectors, and decentralization and the roles of provinces and local authorities.

Section 3 provides a review of public health programs, and the response of the public health community to the fast changing burden of disease. It reviews activities focused on both communicable and non-communicable diseases, and the trends in IR Iran over time and in comparison with regional neighbors and other countries in the world. It further examines the traditional roles of public health such as disease surveillance; it reviews occupational and safety issues, environmental health, and ongoing challenges with undernutrition.

Sections 4 and 5 review the delivery system, focusing on primary care in Section 4 and secondary services including hospitals in Section 5. Each section looks at the organization of health services utilization of services, physical resources, medical equipment and devices, and management autonomy. Sections 4 and 5 also include discussions of quality and training. Section 5 in particular looks at issues of quality and regulation, including licensure and accreditation. Quality includes patient satisfaction and the section concludes some discussion of satisfaction and responsiveness to families and consumers of health care.

Section 6 reviews health expenditures and health financing. After an introduction and review of health expenditures, the section reviews sources of revenues, pooling, management and purchasing of services, and inputs into the sector.

Sections 7, 8, and 9 look at key sectoral input factors that are pivotal for decisions regarding current investments as well as future “payoffs” in terms of efficiency, quality of services, and modernization of
the sector. Investments are related both to material infrastructure and human capital. These sections focus on topical areas of pharmaceuticals, information and management systems, and human resources; and they further examine the associated legal, regulatory, and governance apparatus needed to foster the growth of an efficient yet integrated private and public health sector.

Section 7 reviews the pharmaceutical sector looking at organization, regulation, manufacturing, distribution, and utilization. This is a sizeable subsector, and it has fallen behind international best practice due to subsidies developed during an era of a planned economy, and due to lack of participation in the international marketplace, including the disregard of international patent law.

Section 8 reviews Health Management Information Systems (HMIS) and develops a series of next steps on strengthening the HMIS in the health sector. If IR Iran is to move to evidence-based policy, it will need to develop an information infrastructure for its financing, delivery, and quality of care systems including surveillance. So too intellectual property rights will need to be observed to protect new innovations that foster a more rapid application of new information technology. Lastly, a pipeline of new human resources talent will need to be cultivated.

Section 9 reviews Human Resources and Training, including planning of health care personnel, training of health care personnel, and continuous medical education programs. The mix and numbers of professionals will need to change in the years ahead; and the curriculum and training approach to education will require modernization. Quality education, especially continuing and professional education, and training is needed for a more cost-effective mix of services and a more dynamic sector.

Issues of stewardship, governance, and regulation are critical in IR Iran across all sectors; the health sector is no exception. Each of the nine sections integrates discussions in these topic areas. Likewise, each section presents regional and international comparisons as well as indicators of performance on measures of efficiency, equity, and outcomes. Finally each section assesses findings in the context of implications for policy and provides a series of short-term (one to two years) and medium-term (three to five years) recommendations.

This volume ends with four annexes. Annex A and Annex B provide a short analysis of IR Iran and the Millennium Development Goals and the Human Development Indicators, respectively. Annex C is a Glossary of Terms. Annex D is Acknowledgements to recognize the many people and organizations who helped make this report possible.
Section 2
Background and Overview of the Islamic Republic of Iran and the Health Sector

Geography and Sociodemographics

The Islamic Republic of Iran (IR Iran) is located in South West Asia and ranks as the sixteenth largest country in the world in terms of land size. The country occupies a surface area of 1,648,000 square kilometers. IR Iran shares its borders with Armenia, Azerbaijan, and Turkmenistan to the north, Afghanistan and Pakistan to the east, and Turkey and Iraq to the west. The county has access to both the Caspian Sea in the north and the Persian Gulf and Oman Sea in the south.

According to the 1996 population census, the total population of the country was 60,055,488, of which 61.3 percent lived in urban areas. Based on the most recent population projections by Statistical Center of Iran (2006), the country’s total population in 2005 was 68,467,413 and 67 percent of the total population lived in urban areas. The population density was estimated at 41.4 per square kilometer.

The Islamic Republic of Iran is a multiethnic and multicultural country with diverse histories, values, and norms. Ethnic groups include Persian (51 percent), Azeri (24 percent), Gilaki and Mazandarani (8 percent), Kurd (7 percent), Arab (3 percent), Lur (2 percent), Baloch (2 percent), Turkmen (2 percent), and other (1 percent). The official language and script of the country is Persian. However, other languages are quite commonly spoken: Turkic and Turkic dialects, Kurdish, Luri, Balochi, Arabic, and Turkish. Over 99 percent of the population is Muslims; 0.2 percent is Christians, 0.07 percent Zoroastrians, and 0.05 percent Jews.

Political and Administrative Structure

The form of government is an Islamic Republic, and it was founded in the aftermath of the popular uprising of 1979. The Iranian Revolution and the establishment of the Islamic Republic owe greatly to the leadership of the architect of the revolution, Imam Khomeini. In a referendum held in March 1979, 98.2 percent of the eligible voters in IR Iran voted in favor of establishing an Islamic Republic. Furthermore, in another referendum in November 1979, the Iranian people approved a new constitution determining its political structure and body of basic laws of the land.

The country’s political structure is based on the new constitution and is considered a democratic system of government with separations of power. Officials of the executive branch and representatives in the legislative branch are elected by popular vote, while the judiciary is an independent branch. The national level of governance is complemented by local councils that also are popularly elected (from village councils to district and provincial councils as stipulated in the Principle 100 of the Constitution).

According to the principles of the Constitution, Zoroastrian, Jewish, and Christian Iranians are considered religious minorities; they are represented in the parliament and are free to practice according to their own religious norms and rituals.
Importantly, this form of democracy and these democratic institutions must operate within the teachings of Islam. All ratifications of the Islamic Consultative Assembly are screened by the Council of Guardians in terms of compatibility with Islam and the Constitution. According to Principle 93 of the Constitution, “The Islamic Consultative Assembly has no legal value in the absence of the Council of Guardians.” The latter is composed of six Muslim jurisprudents, who are “just, and aware of the issues,” and who are appointed by the leadership of the country; and six other lawyers who are proposed by the chief of the judiciary and confirmed by the Islamic Consultative Assembly. One of its responsibilities is to convene nationwide referendums: should a difference of opinion emerge between the Council of Guardians and the Islamic Consultative Assembly, judgment resides with the Islamic Order’s Expediency Council (The Constitution 2002).

The supreme religious leader is selected by the “experts” elected by the people, and who form the Khobregan Council, or the highest council of religious leaders. The Khobregan Council also oversees the acts and performance of the supreme religious leader. Included in the duties of the nation’s Religious Leader are determining the general policy lines of the country and supervising the execution of such policies, commanding the entire armed forces, declaring war or peace, deposing and appointing some of the highest ranking officials such as, the chief of the judiciary, the chief of the Islamic Republic of Iran’s broadcasting system, the chief of the Joint Chiefs of Staff, and commanders of the armed forces and the Islamic Revolutionary Guards Corps. The leader is equal to other citizens before the law (The Constitution 2002).

The public sector consists of the government (the central government and 30 provincial level administrations), over 400 state-owned companies, and financial and nonfinancial organizations. The
The public budget includes that of the government and the budget allocated to government offices separately. The government budget contains governmental financial aid for investments that are registered in the Budget Act under the heading “Development Budget.”

Administratively the country is divided into 30 provinces, 294 townships, 857 cities, and over 83,000 villages (MOHME 2003b). Governor generals are the highest provincial political official and are representatives of the central government. Provincial directors have only partial or relative authority in some areas. For example, the Universities of Medical Sciences and Health Services have substantial powers to decide the following issues through their board of trustees:

- Budget approvals;
- Approval of the allocation scheme of local revenues;
- Contracts with the private sector;
- Collection of aid (cash, in-kind, and construction materials) at the local levels;
- Approval of financial and contractual bylaws;
- Determination of manner of running manufacturing, service units, and workshop units affiliated with universities;
- Payment of research, teaching, translation, and compilation fees; and,
- Ratification of employment regulations concerning faculty members (High Council 1988).

The financing of a major part of the government sector’s expenditure takes place through the government’s general budget. The budget process is initially bottom up with district and provincial levels estimates sent to the central government. The central government, represented by the Management and Planning Organization (MPO), reviews and determines final budgets.

Planning is usually devised at the central level, then announced to provinces and subsequently to districts for implementation. Policy making and supervision of implementation of plans are done at the national level. In a review published in 2000 (MPO 2000), the MPO found that the central level’s shouldering of executive affairs has led to growth at the national level over time. It also determined that a comprehensive information system was lacking; work assessment and program evaluation were not systematically performed, and laws and regulations were often too inflexible to allow implementation of national plans.

The country has developed a series of Five-Year Development Plans since the revolution. The Fourth Five-Year Development Plan pursues an agenda to improve and reform the administrative system of the country:

- Improvement of economic structure, by streamlining the monopolies and transferring the ownership of government companies to private and cooperative sectors;
- Reforming the public sector’s management, by limiting the government’s role in economic activities, and concentrating it in the administrative realm;
- Executing appropriate policies for reforming the functions of markets, capital, labor, goods, and services and increasing economic efficiency;
- Improving the distribution system of revenues and clarifying the objectives for subsidies; and,
- Decentralization, with greater authority going to provincial officials, and moving to greater participation by urban and rural Islamic Councils in running the affairs of the country (MPO 2000).
The Health Sector: Governance and Stewardship

The Ministry of Health and Medical Education (MOHME) is the primary body responsible for oversight of the health system in IR Iran. The MOHME has the legal authority to oversee, license, and regulate the activities of the private sector.

Most of the other supervisory and regulatory functions are conducted by MOHME itself or by the Universities of Medical Sciences on its behalf in the provinces. The Universities of Medical Sciences have a functional authority for supervising health care organizations and care standards, and they are ultimately responsible for the protection of patients and other citizens as consumers of health services and health-related products such as food and drugs.

The MOHME also has joint (and sometimes overlapping) supervisory and regulatory functions in such areas as occupational health (with the Ministry of Labor), water sanitation (with the Ministry of Energy), food safety (with the Ministry of Agriculture), environmental health (with the municipalities and the State Environmental Protection Organization), and school health (with the Ministry of Education).

Other units and arms of the government also play significant roles. For instance, setting health services fees, which are strictly regulated by the government, is the responsibility of the Supreme Insurance Council, which consists of representatives from the MOHME, insurance corporations, and other economic and governmental bodies. This council develops suggestions for medical fees for Cabinet approval; once approved, compliance by health care professionals is mandatory.

Other nongovernmental bodies also are involved in regulation. For instance, the Islamic Republic of Iran Medical Council (IRIMC) is a nongovernmental organization that regulates the relationship of most health care professionals with the government. It partakes in the licensing of medical professionals and acts as a union for the medical community.

Macroeconomic Trends and Policies

Under the Third and Fourth Five-Year Plans (FYP) (2000/01–2004/05 and 2005/6–2009/10 respectively), IR Iran has achieved significant economic gains. It has virtually no external debt, high foreign reserves, no major balance of payment pressures, and a moderate fiscal deficit that reflects increasingly explicit subsidies, including indirect ones (largely in the energy sector). Over the past 25 years, substantial progress has been made in reducing poverty with the poverty rate falling from 47 percent in 1978 to today’s estimated 19 percent. Structural reforms have advanced, with gains in financial markets, trade and price liberalization, and tax policy. Institutional reforms have included increased decentralization and greater accountability in the budget and public expenditure process. Efforts to shift from a state-dominated economy driven by subsidies to increased private sector participation have been met with some success.

The country’s economic growth and external position are strong at present, but accelerating inflation and structural issues require serious attention. Growth in the gross domestic product (GDP) was 5.9 percent in 2006/07, a marginal increase compared to 5.4 percent a year earlier (Figure 2-2). Both oil and non-oil sources have contributed to growth; and, non-oil exports reached USD 14.2 billion in 2005/06. This represents a 40 percent increase in nominal terms compared with the same period a year ago; however, this is due to a large extent to favorable terms of trade. The balance of payments and external debt position remain comfortable. In 2005, GDP per capita was USD 2,228.6, which is equivalent to USD 9,360 adjusted for purchasing power parity (PPP).
A substantial portion of economic growth is due to the rapid growth in exports. Crude oil export revenues are expected to exceed USD 50 billion in 2006/07. Non-oil exports have swelled as well, for several reasons: growing differentials between global and domestic oil prices, successful marketing strategies focused on emerging markets, and higher investments in the petrochemicals sector. Petrochemicals make up 38.3 percent of non-oil exports, other industrial commodities constitute 33.8 percent, agricultural products are 13.4 percent, minerals account for 5.5 percent, carpets and handicrafts constitute 6 percent, and minerals 3.4 percent.

Government revenues constitute approximately 25 percent of GDP. About two-thirds of government revenues come from oil; another third from taxes (Table 2-1). Other sources of revenues include: personal income, wealth, imports, consumption and sales of public resources. At present foodstuff and pharmaceuticals are tax exempt.

| Table 2-1: Budgetary Operations as Percentage of GDP at Factor Costs |
|------------------|------------------|------------------|------------------|------------------|
|                  | 2003/04 | 2004/05 | 2005/06 | 2006/07 |
| Revenue           | 22.6    | 22.1    | 26.9    | 27.9    |
| Oil               | 15.5    | 14.7    | 18.4    | 19.2    |
| Non-oil           | 7.1     | 7.4     | 8.5     | 8.7     |

Tax exemptions for a number of companies, including the oil company, have been eliminated since 1995 (PBO 1998). Nevertheless, energy subsidies remain high, though recently the government has taken first steps toward their reduction. Energy subsidies exceeded 15 percent of GDP in 2005/06. Low domestic energy prices have caused inefficiency, excessive consumption, corruption, smuggling, and environmental damage. The rich benefit from the subsidies much more than the poor.

Inflation is emerging as a source of serious concern: the Consumer Price Index (CPI) is expected to increase by 18 percent in 2006/07 compared to about 12 percent a year ago as a result of the expansionary effects of current fiscal and monetary policy. Despite oil prices exceeding the reference price (set in the
budget) by a wide margin, the balance of the Oil Stabilization Fund (OSF) at year-end is expected to decline compared to the beginning of the year.

The Islamic Republic of Iran has demonstrated a relatively poor business environment for private firms and in 2006, was ranked by the World Bank 119th out of 175 economies on the overall costs of “doing business.” The use of funds from the Oil Stabilization Fund has tripled. From a structural perspective, inefficient investments and large energy subsidies constrain employment growth.

Unemployment has exceeded 10 percent for the last 15 years and remains high, at 10.2 percent overall. Youth and young adult unemployment remains high (18.9 percent for the age group 15–29 years), and unemployment is almost twice as high for women as for men, at 15 percent and 8 percent nationally. IR Iran achieved some success in reducing the unemployment rate by about 3 percentage points, to 10.9 percent in the third quarter 2005–2006, but job growth remains a major challenge. Over the past decade, job growth has averaged about 2 percent per year, significantly less than GDP growth.

The investment environment remains a challenge for private sector growth and economic competitiveness. A relatively high tax burden may also discourage formalization of private sector activities. Official estimates of informal activity as a percentage of GDP are less than 3 percent (Golami 2005); independent observers place it at closer to 20 percent for 2002–2003, twice the level of most OECD economies (F. Schneider 2006). Finally, the governance structure of the public sector has limited tools to attract competent human capital that will assist in rapid economic growth.

A last aspect of the macroeconomy that is linked with the health sector is that IR Iran is highly vulnerable to a range of natural hazards, especially earthquakes and floods. It is known to be one of the most earthquake-prone countries in the world. In the 20th century alone, more than 20 large earthquakes claimed an estimated 140,000 lives, destroyed many villages and cities, and caused extensive economic damage. The latest earthquake affecting the city of Bam in December 2003 caused an estimated 43,000 deaths. Floods too are a frequent natural disaster. Since 1990, floods have recurred with an average of 43 events per year and an average of 135 lives lost per year.

Trends in Poverty

The Fourth Five-Year Development Plan of Iran places strong emphasis on social justice, with individual health and security as one of the principal objectives. Among other things, the plan calls for (i) a reduction of poverty, from 15 percent to 7 percent; (ii) a favorable distribution of income among various social strata; (iii) an improvement in social welfare; (iv) an improvement on the Human Development Index (see Annex A); (v) a further reduction of child mortality; and (vi) an increase in life expectancy.

Poverty levels have been defined differently across institutions and analyses. The government conducts various surveys annually (e.g., Household Income and Expenditure Survey (HIES)). However, it has not tracked or measured the incidence of poverty systematically until very recently. According to the recent United Nations report (United Nations 2003), about 20 percent of Iranians lived in poverty in 2003, based on a poverty line of Rls 8,800 ($3.6 in international dollars) per capita per day. Using a poverty line of USD 2 per capita per day, and adjusting for PPPs using a rural index, about 1 percent of the Iranian population lived in poverty in urban areas and 7 percent in rural areas in 2004 (Sahehi-Ishafani 2006). Regardless of the poverty measure, evidence suggests the incidence of poverty in IR Iran has declined steadily over the last thirty years. This trend holds true for both urban and rural areas as shown in Figures 2-3 and 2-4.
Figures 2-3 and 2-4: Trends in Poverty Rates in Urban and Rural Areas

Note: AP denotes poverty line set by Assadzadeh and Paul (2004); USD 2 denotes the USD 2 per day poverty line.

The relative proportion of the poor increased in urban areas from 1986 to 1998. The increase is associated with migration of the rural population to urban areas as well as urban sprawl.

Table 2-2: Trends in Poverty

<table>
<thead>
<tr>
<th></th>
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<tr>
<td>Percentage of individuals in poverty</td>
<td></td>
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<tr>
<td>Total</td>
<td>27.3</td>
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<td>20.9</td>
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<td>Rural</td>
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<td>30.6</td>
<td>27.7</td>
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<td>Urban</td>
<td>20.9</td>
<td>22.5</td>
<td>17.0</td>
<td>14.2</td>
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<td>Distribution of poor (percent)</td>
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</tr>
<tr>
<td>Rural</td>
<td>58.2</td>
<td>50.8</td>
<td>52.2</td>
<td>56.6</td>
</tr>
<tr>
<td>Urban</td>
<td>41.8</td>
<td>49.2</td>
<td>47.8</td>
<td>43.4</td>
</tr>
</tbody>
</table>


Despite the decline in the prevalence of poverty in rural areas, inequality in income is still much greater in rural areas than urban areas. Nationally, approximately 20 percent of the lowest income households accounts for only 4.7 percent of the total national expenditure, whereas the richest quintile accounts for nearly half. The richest households in urban areas spend almost 17 times more than the poorest households (SCI 2006). In rural areas, the richest households spend 23 times more than the poorest households.

A recent Bank study on poverty utilized a probit regression analysis of the 1990 and 1998 HIES survey to profile the poor, and found that (i) gender, (ii) age, (iii) education, (iv) household size, (v) labor market status, (vi) sector of work, and (vii) geographic region are statistically correlated to the incidence of poverty:

- Gender: The gender of the household head matters for rural poverty but not urban poverty. Rural households headed by females are 13 percent more likely to be poor than those headed by males. In urban areas, the difference in poverty risk between female- and male-headed households is not statistically significant.
- Age: In both urban and rural areas, the risk of poverty declines with age. For example, a rural
household headed by a person of over 50 years old has a 12 percent lower probability of being poor.

- Education: The probability of being poor declines with rising education for both rural and urban households, more dramatically for the former. If the head of a rural household has higher education (beyond high school), the probability of that household’s being poor is reduced by 25 percent (11 percent for urban households).

- Household size: Larger households are associated with poverty. In 1998, those living in urban households with between four and seven members had a 9 percent higher risk of being poor while those living in households with more than seven members had a 26 percent higher risk. The corresponding poverty risks for rural households were 17 and 28 percent, respectively.

- Labor market status: Different aspects of labor market status have different correlations with the risk of being poor. Unemployment clearly increases the risk of poverty, by 8 percent for urban households and 11 percent for rural ones. Compared to the poverty risk faced by public sector employees, being a wage employee in the private sector raises the risk of poverty by 15 percent for rural households but only 3 percent for urban households. On the other hand, being an employer decreases the probability of poverty by almost 12 percent for rural and 6 percent for urban households.

- Sector of work: There are only moderate differences in poverty risks across sectors of work. Being employed in the utilities and mining sector, traditionally a high wage sector, decreases the probability of poverty while being employed in construction, traditionally a low skill wage sector, increases the probability of poverty.

- Region: Whether or not a household is poor also correlates with region. For example, being located in the eastern provinces increases the chance of being poor by almost 25 percent for rural households; this figure is only 4 percent for urban households when compared to the central region, which contains Tehran and Esfahan provinces among others. Location in rural provinces of the Caspian Sea and the West also increase the risk of poverty.

Rapidly Changing Trends in Demography and Epidemiology

Demographic Changes

Over the last two decades, the Islamic Republic of Iran has experienced a rapid demographic change. In the 1970s, IR Iran was a country with high infant mortality and fertility rates. The period following the 1979 Revolution witnessed a relatively rapid reorganization of government institutions and social policies. Policies were structured to provide basic services and amenities, including basic education to all, primary health care services, safe water, and basic foodstuffs to the entire population. In the post revolutionary era, the government’s strong focus on rural primary health care proved successful in improving overall health outcomes. These trends in favorable outcomes have continued; most of the health-related Millennium Development Goals are expected to achieve their targets by 2015 (see Annex B). Urban–rural disparities in health outcomes further show that historic differences have been narrowing since 1979 (Mehryar 2004).
Table 2-3: Trends in Key Health Outcomes

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Life expectancy (male and female)</td>
<td>59</td>
<td>65</td>
<td>69</td>
<td>71</td>
</tr>
<tr>
<td>Infant mortality rate (per 1,000 live births)</td>
<td>92</td>
<td>54</td>
<td>36</td>
<td>31</td>
</tr>
<tr>
<td>Maternal mortality ratio (per 100,000 live births)</td>
<td>n/a</td>
<td>120</td>
<td>76</td>
<td>n/a</td>
</tr>
</tbody>
</table>


Relatively easy access to family planning services through the primary health care (PHC) programs (see Section 4), and an increased literacy level were crucial factors leading to sharp a decrease in total fertility and population growth rates of the country (Roudi-Fahimi 2002). Through PHC services, the government strongly supported the use of contraceptives among married women. In 2005, 79 percent of the married women practiced family planning, up from 37 percent in 1976. In the last twenty years, the total fertility rate has decreased by two-thirds: from 7.1 children per woman in the 1980s to 2.1 in 2005 (MOHME 2007b). The average fertility rate has now stabilized at a replacement level of 2.1. As shown in Figure 2-5, IR Iran has experienced a much more rapid reduction of total fertility than neighboring countries.

Table 2-4: Trend of Crude Birth and Total Fertility Rates in IR Iran

<table>
<thead>
<tr>
<th>Years</th>
<th>Crude Birth Rates</th>
<th>Total Fertility Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973–1976</td>
<td>42.9</td>
<td>6.6</td>
</tr>
<tr>
<td>1986</td>
<td>49.6</td>
<td>7.1</td>
</tr>
<tr>
<td>1991</td>
<td>30.6</td>
<td>4.9</td>
</tr>
<tr>
<td>1996</td>
<td>20.5</td>
<td>2.6</td>
</tr>
<tr>
<td>2002</td>
<td>18.3</td>
<td>2.6</td>
</tr>
<tr>
<td>2005</td>
<td>14.5</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Source: SCI (2005); World Bank staff estimates for 2005.

Figure 2-5: Trend of Total Fertility Rates In Selected Countries


The Iranian population tripled from about 20 million in the 1960s to approximately 60 million in the 2000s. With the government’s strong population control policy (Box 2-1), the annual population growth was reduced from around 3 percent in the 1980s to 1.4 percent in the 2000s (Table 2-5).
Box 2-1: IR Iran Family Planning Successes

The Government of the Islamic Republic of Iran launched the national family planning program in late 1989. A family planning bill was passed in 1993; it removed most of the economic incentives for having large families, and social benefits were curtailed to a couple’s first three children. The fertility decline success can be attributed to the increase in contraceptive use among married women, as well as the increase in women’s average age at first marriage (from 19.7 years old in 1976 to 22.4 in 1996). All modern contraceptive methods are currently available to married couples free of charge at public clinics. Contraceptive pills are the most popular modern method, followed by female sterilization. Information and education campaign has assured the public that family planning is consistent with Islamic tenets and does not threaten family values. Population education is also part of the curriculum at all education levels, and couples who plan to marry participate in government-sponsored family planning classes before receiving their marriage license. With these efforts, the government has succeeded in delaying first pregnancies and in spacing out subsequent births; discouraged pregnancy among women younger than 18 and older than 35; and limited the family size to three children.


Table 2-5: Trends in Total Population and Growth Rate

<table>
<thead>
<tr>
<th>Years</th>
<th>Five-Year Average of Population (Millions)</th>
<th>Average Growth Rate per Year (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960–1965</td>
<td>22.7</td>
<td>2.64</td>
</tr>
<tr>
<td>1966–1970</td>
<td>26.8</td>
<td>2.84</td>
</tr>
<tr>
<td>1971–1975</td>
<td>31.2</td>
<td>3.11</td>
</tr>
<tr>
<td>1976–1980</td>
<td>36.6</td>
<td>3.28</td>
</tr>
<tr>
<td>1981–1985</td>
<td>43.7</td>
<td>3.71</td>
</tr>
<tr>
<td>1986–1990</td>
<td>51.8</td>
<td>2.88</td>
</tr>
<tr>
<td>1991–1995</td>
<td>57.1</td>
<td>1.61</td>
</tr>
<tr>
<td>1996–2000</td>
<td>61.8</td>
<td>1.54</td>
</tr>
<tr>
<td>2001–2005</td>
<td>66.4</td>
<td>1.40</td>
</tr>
</tbody>
</table>

Source: WDI (2007).

Note: Mid-year population estimates of each year are used for calculation.

As the total fertility rate reached stabilization at the population replacement level, the age structure of the Iranian population experienced a significant shift. Figures 2-6 and 2-7 show that the country is experiencing a youth bulge and in the next two decades, its demographic profiles will be aging. In 2005, the proportion of under-15 year olds was 28.7 percent whereas those aged 15–24 accounted for a quarter of the total population. Nearly 40 percent of the population was of working age, and only 6.4 percent was over 60 years old. In 2025, it is projected that the proportion of under-15 year olds will be reduced to 23.3 percent. On the other hand, the cohort that belonged to the youth age group (15–24) in 2005 will migrate to the working age population, resulting in a sharp increase of this age group, to 51.3 percent of the total population. The proportion of over 60 will nearly double to 11 percent. At current trends, by 2050, the percentage of those who are over 60 will increase to 26 percent (World Bank 2007a.)
In twenty years, these relative reductions in younger populations and substantially increased numbers of older groups will impact the labor and social policies. The changing mix of population can further be expected to change the epidemiologic profile and the burden of disease in the country (discussed below).

**Figures 2-6 and 2-7: Population Pyramid in 2005 and 2025**


Another significant demographic trend in IR Iran is the urbanization of the population. In 1980, almost half of the population (49.6 percent) lived in urban areas (UNDP 2006). In the last two decades, the proportion of urban and rural population has reversed (Table 2-6), with nearly 70 percent of the population living in urban areas by 2005. The urbanization of the population is attributed to migration of the population in search of better economic opportunities.

The migration from villages to larger cities dates back to the 1960s. The government initiated a pilot scheme to encourage rural migrants to return to their villages of origin. To date, there has been little impact in part due to lack of economic opportunities in rural areas but also due to changing lifestyles (i.e., rural migrants acquiring urban lifestyles) (UN-IRIN 2003). Furthermore, a UN report suggests that current urban migration trends will result in around 80 percent of all Iranians living in urban areas by 2030.

**Table 2-6: Trends in Urban and Rural Populations**

<table>
<thead>
<tr>
<th>Year</th>
<th>Urban (%)</th>
<th>Rural (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>49.6</td>
<td>50.4</td>
</tr>
<tr>
<td>1996</td>
<td>62</td>
<td>38</td>
</tr>
<tr>
<td>1998</td>
<td>63</td>
<td>37</td>
</tr>
<tr>
<td>2000</td>
<td>64</td>
<td>36</td>
</tr>
<tr>
<td>2002</td>
<td>67</td>
<td>33</td>
</tr>
<tr>
<td>2005</td>
<td>67</td>
<td>33</td>
</tr>
</tbody>
</table>


**Changes in Epidemiologic Patterns**

Expansion of access to primary health care (PHC) and immunization coverage has enabled IR Iran to successfully reduce its infant mortality rate (IMR) and under-five mortality rate: from 130 and 92 per
1,000 live births respectively in 1980 to 36 and 31 per 1,000 live births in 2005, respectively (Figure 2-8). The impressive decline in the IMR figures can be attributed in part to the introduction and rapid scale up of three programs: (i) the Expanded Program for Immunization (EPI); (ii) the promotion of breast-feeding; (iii) and, the Integrated Management of Childhood Illness Program to manage acute respiratory and acute diarrhoeal illness (Malekafzali 2004).

**Figure 2-8: Infant and Under-Five Mortality Levels (1908–2005)**

IR Iran has been particularly successful in achieving very high coverage for immunization (Figure 2-9): reaching 99 percent by the year 2000 and nearly 100 percent by 2004 for BCG, triple vaccine, oral polio, hepatitis B, and meningitis.

**Figure 2-9: Immunization Coverage (1980–2000)**

The Expanded Program for Immunization also has led to dramatic declines in the number of vaccine-preventable childhood illnesses. The number of measles and whooping cough cases has declined substantially; diphtheria and tetanus (including neonatal tetanus), between 1980 and 2003, were reduced seven- and nine fold respectively; and, since 2001, there have been no reported cases of polio.
As with infant mortality, the maternal mortality rate has improved too. By 2000, 79 percent of expectant mothers had antenatal care (MOHME 2001b) and 89.6 percent of births were attended by skilled health personnel such as, trained physicians and midwives (WHO 2006b). Between 1990 and 2000, the spacing between two consecutive pregnancies increased from 33.1 to 47.8 months, while the age at first pregnancy increased from 20 to 22 years (MOHME 2000a).

Collectively, these improvements have helped to gradually reduce the national estimates of maternal mortality levels from estimated 91 per 100,000 live births in 1985 to 54 in 1991, 39 in 1995, and 37.4 in 1997. The WHO/UNFPA/UNICEF estimate has reflected similar reductions of MMR over the last ten years. For the year of 2000, their MMR estimate was derived from the census data and was 76 per 100,000 live births, higher than the national estimates2 (WHO 2004a). By 2015, the government aims to reduce MMR to 27 per 100,000 live births (Office of the Deputy for Social Affairs 2004). If the MMR continues to decline at the current pace, it is likely that IR Iran will achieve this target. However, 34 percent women of childbearing age still have iron deficiency while 17 percent women suffer from iron deficiency anemia.

As the demographic profile changes and communicable diseases are relatively well controlled, IR Iran now faces a burden of disease increasingly predominated by non-communicable diseases (NCDs) and accidents. With its aging population, the burden of disease profile is increasingly characterized by cardiovascular disorders, cancers, and mental illness as well as environmental health hazards. At the same time, some infectious diseases like HIV/AIDS among intravenous drug users and tuberculosis among those living with HIV/AIDS, are re-emerging.

Several factors are contributing to a changing epidemiologic profile. These include:

- As the total fertility ratio declines to the replacement level and people live longer due to the advancement of medical technology and interventions, the proportion of elderly people has increased;
- Increased sedentary lifestyle, and the increased intake of energy dense food, as well as increased consumption of animal fats and refined sugars;
- Rapid industrialization has resulted in growth of environmental and occupational hazards;
- Industrialization and energy subsidies have combined to increase levels of automobile traffic;
- Relatively easy access to opium, heroin, and hashish due to relatively porous borders with neighboring countries; and,
- Changing cultural and social norms.

According to the most recent Burden of Disease and Risk Factors study of IR Iran conducted in 2003 (Naghavi 2003), non-communicable diseases account for 45 percent of the total disease burden for males and 33 percent for females. This is followed by traffic accidents and injuries (including natural disasters)3 in males (11 percent of the total disease burden), then pre-transitional diseases (communicable diseases, prenatal and maternal conditions, and nutritional deficiencies) in males and females (4 percent each), and finally, traffic accidents and injuries in females (3 percent) (Figures 2-10, 2-11, and 2-12).

---

2 Maternal Mortality Ratio is a notoriously difficult indicator to measure. Often times, national estimates and UNICEF/WHO/UNFPA’s estimate differ due to the methodological difference. World Bank uses the UNICEF/WHO/UNFPA’s estimate for projection of the MDG trend analysis.

3 Natural disasters, particularly the Bam earthquake that occurred in south-eastern Iran in December 2003, caused more than 26,000 deaths and approximately 30,000 injuries. Though this is a significant number, Naghavi (2003) does not accounted for them.
Figure 2-10: Twenty-One Priority Disease Conditions for Both Sexes, All Ages

Note: By Years Lost Due to Premature Mortality and to Disability.

Figure 2-11: Burden of Disease for Males

Note: By Years Lost Due to Premature Mortality and to Disability.
For the total years lost to disabilities (YLD), the disease burden for males is composed of 48 percent of the total YLDs, while it is 39 percent for females (Naghavi 2003). Incidence rates of Years Lost of Life (YLL) are 10,050 per 100,000 for men and 6,545 per 100,000 for women. Women experience more disabling diseases than their male counterparts, while men experience more fatal diseases than female counterparts.

Accidents and Injuries

Traffic injuries comprise the number one burden of disease in the country, with the highest number of DALYs accrued for the population (Figure 2-11). A full 80 percent of injuries and deaths due to traffic accidents occur among males. In 2003, almost 26,000 people were killed in road accidents in IR Iran according to the Ministry of Health and Medical Education (World Bank 2004). This is equivalent to three fatalities per hour due to traffic accidents. From 2000 to 2003 alone, the number of fatalities increased by more than 50 percent and from 2002 to 2003 by more than 17 percent. The tendency is even more serious for the number of injuries; they more than doubled from 2000 to 2003 and increased by 33 percent from 2002 to 2003.

Most accidents (approximately 80 percent) are registered on urban roads while most fatalities (81 percent) are registered on rural roads, with 0.12 fatalities per casualty accident in rural areas compared to 0.02 in urban areas. The seriousness of accidents is higher on rural roads than on urban ones, with 0.56 and 0.18 casualties per accident respectively (Table 2-7). Safety helmets and seat belts seem to be used infrequently by people involved in accidents, leading to more serious accidents and causing significant public health problems (World Bank 2004).
Table 2-7: Distribution of Accidents in Urban and Rural Areas (2001)

<table>
<thead>
<tr>
<th></th>
<th>Total Country</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatal accidents</td>
<td>3,073</td>
<td>76</td>
<td>24</td>
</tr>
<tr>
<td>Fatalities</td>
<td>4,381</td>
<td>81</td>
<td>19</td>
</tr>
<tr>
<td>Injury accidents</td>
<td>65,035</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>Injuries</td>
<td>90,355</td>
<td>48</td>
<td>52</td>
</tr>
<tr>
<td>Accident damage only</td>
<td>28,745</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>Total accidents</td>
<td>346,853</td>
<td>24</td>
<td>76</td>
</tr>
<tr>
<td>Total casualties</td>
<td>94,736</td>
<td>49</td>
<td>51</td>
</tr>
</tbody>
</table>

**Seriousness**

<table>
<thead>
<tr>
<th></th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatal per casualty</td>
<td>0.05</td>
<td>0.08</td>
</tr>
<tr>
<td>Fatal per accident</td>
<td>0.01</td>
<td>0.03</td>
</tr>
<tr>
<td>Fatal per casualty accident</td>
<td>0.06</td>
<td>0.12</td>
</tr>
<tr>
<td>Casualties per casualty accident</td>
<td>1.39</td>
<td>1.63</td>
</tr>
<tr>
<td>Fatal per fatal accident</td>
<td>1.43</td>
<td>1.52</td>
</tr>
<tr>
<td>Casualties per accident</td>
<td>0.27</td>
<td>0.56</td>
</tr>
</tbody>
</table>

*Source: World Bank (2004).*

With close to 400 deaths per 1 million inhabitants, IR Iran is four to five times above the average for industrialized countries. Compared to neighboring countries such as Turkey and Azerbaijan, the number of fatalities per 10,000 vehicles is also significantly higher, with approximately 50 in IR Iran, 20 in Azerbaijan, and 7 in Turkey (Figure 2-13).

**Figure 2-13: Fatalities per 10,000 Vehicles: IR Iran Compared to Other Selected Countries**

[Bar chart showing fatalities per 10,000 vehicles for various countries including Iran, Azerbaijan, Egypt, South Korea, Russia, Thailand, and Turkey.]

*Source: World Bank (2004).*

Estimates indicate the economic costs of fatalities and injuries in IR Iran are significant: up to 1.8 to 4.0 percent (USD 2–4 billion) of GDP per year. This is quite high compared to other middle income countries, where accident costs account for 1.5 percent of GDP on average (World Bank 2004).
Cardiovascular Disease

After accidents and deaths caused by natural disasters (Yusuf et al. 2001), cardiovascular diseases (CVDs), namely ischemic heart disease and cerebrovascular diseases, are the third and fourth highest ranking category of causes of death. Cerebral vascular accidents (CVA) and myocardial infarction (MI) were the leading causes of death and attributed to 157,641 deaths, equivalent to 38 percent of total deaths. Hypertension, or high blood pressure, and smoking are the leading risk factors for CVDs.

Mental Health

Psychiatric and behavioral diseases account for 16 percent of the total DALYs in IR Iran, ranking third among the 21 priority burdensome disease conditions, after accidents and ischemic heart disease. Among all mental diseases, depression accounts for 26 percent of the total burden and drug addiction for 24 percent. A relatively recent study conducted among 35,000 individuals on mental health among the adult population (Noorbala et al. 2004) showed about a fifth were found as likely cases of mental disorders, where women were also found to have higher levels (26 percent) than men (15 percent) (Table 2-8). There was an equal urban–rural split, with 21–20 percent respectively. Being divorced or widowed and being a housewife or unemployed were main correlates of mental illnesses. Table 2-8 indicates that the prevalence of mental disorders increases with age. However, it must be noted that one of the distinct causes of death among youth is suicide. According to Statistical Center of Iran, 40 percent of suicide cases in 2004 occurred among youth 18–24 years old.

<table>
<thead>
<tr>
<th>Place of Residence</th>
<th>Male</th>
<th>Unmarried</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>21.3</td>
<td>18.0</td>
</tr>
<tr>
<td>Urban</td>
<td>20.9</td>
<td>25.0</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>27.0</td>
<td></td>
</tr>
<tr>
<td>Private sector</td>
<td>19.8</td>
<td></td>
</tr>
<tr>
<td>Farmer</td>
<td>25.0</td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>12.7</td>
<td></td>
</tr>
</tbody>
</table>

Source: Noorbala et al. (2004).

Depression. The burden of depression is quite high, in particular among women; it is 15 percent of the total DALYs among the total burden for women. The Iranian women’s social roles as housewives and working only within the home appear to correlate with psychiatric morbidity. Possible explanations of the higher risk of mental illness among Iranian women generally are the “social inconveniences experienced more by women than by men” according to MOHME (2007).

Substance Addiction and HIV/AIDS

Geographically, the Islamic Republic of Iran is located on a major narcotics transit route. Its neighbor, Afghanistan, is the biggest narcotics producer in the world. IR Iran is experiencing a major problem, growing population of injecting drug users (IDUs). While the official number of drug addicts in late 1980s was around 140,000, the current estimate is as many as 3–4 million. The incidence of opium consumption among the population over 15 years old was reported at 10.4 percent (MOHME 2001a),
while the average age of first use of opium among addicts is 27.4 years old. An estimated 70 percent of the IDUs are under 30 years old (UNAIDS 2004), and a large proportion of young IDUs (20–29 years old) tends to share needles. According to a recent study, an estimated 68 percent of HIV cases shared needles when injecting drugs, exposing the Iranian youth to a greater risk of HIV infection. Currently, there are 13,432 registered HIV/AIDS cases and nearly 64 percent are IDUs; yet, the official estimate of 70,000 HIV infected cases is much higher than the registered cases. Anecdotally, it is thought that HIV infection has been spreading to non-IDUs, such as partners of IDUs, commercial sex workers, and possibly youth, who tend to have risky sexual behaviors. On a recent HIV awareness survey, UNAIDS reports that there is a lack of knowledge and understanding of risky behaviors and their impact among the general population (UNAIDS 2004).

**Diabetes**

Another emerging public health concern is diabetes mellitus, especially noninsulin dependent type 2 diabetes. A higher portion of the urban population is found to have high blood sugar levels compared to the rural population (25 percent and 15 percent, respectively). There are almost twice as many diabetics in the urban population than in the rural population (3.1 percent and 1.9 percent, respectively). In 2005, 2.6 percent of men and 3.6 percent of women in urban areas reported having diabetes, which is an 86 percent increase among men and a 44 percent increase among women in urban areas relative to 1999 (Ghassemi et al. 2002). The incidence of diabetes in rural areas increased by 13 percent, from 2.1 percent to 3.1 percent between 2001 and 2003. In the estimated DALYs caused by diabetes, IR Iran however ranks seventh best among 18 Middle East and neighboring countries (Table 2-9).

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>DALYs due to Diabetes Mellitus (per 100,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>United Arab Emirates</td>
<td>957</td>
</tr>
<tr>
<td>2</td>
<td>Armenia</td>
<td>616</td>
</tr>
<tr>
<td>3</td>
<td>Qatar</td>
<td>604</td>
</tr>
<tr>
<td>4</td>
<td>Kuwait</td>
<td>426</td>
</tr>
<tr>
<td>5</td>
<td>Azerbaijan</td>
<td>418</td>
</tr>
<tr>
<td>6</td>
<td>Saudi Arabia</td>
<td>389</td>
</tr>
<tr>
<td>7</td>
<td>Oman</td>
<td>366</td>
</tr>
<tr>
<td>8</td>
<td>Lebanon</td>
<td>353</td>
</tr>
<tr>
<td>9</td>
<td>Egypt</td>
<td>295</td>
</tr>
<tr>
<td>10</td>
<td>Syrian Arab Republic</td>
<td>288</td>
</tr>
<tr>
<td>11</td>
<td>Pakistan</td>
<td>241</td>
</tr>
<tr>
<td>12</td>
<td><strong>IRAN, Islamic Republic of</strong></td>
<td><strong>236</strong></td>
</tr>
<tr>
<td>13</td>
<td>Jordan</td>
<td>232</td>
</tr>
<tr>
<td>14</td>
<td>Afghanistan</td>
<td>214</td>
</tr>
<tr>
<td>15</td>
<td>Turkey</td>
<td>212</td>
</tr>
<tr>
<td>16</td>
<td>Turkmenistan</td>
<td>206</td>
</tr>
<tr>
<td>17</td>
<td>Iraq</td>
<td>192</td>
</tr>
<tr>
<td>18</td>
<td>Yemen</td>
<td>131</td>
</tr>
</tbody>
</table>

Behavioral change and public health interventions for mitigating risk factors play an increasingly important part in reducing mortality and morbidity, as summarized in Table 2-10, and discussed in more detail in Sections 3 and 4.

**Table 2-10: Major Causes of Morbidity**

<table>
<thead>
<tr>
<th></th>
<th>Major Causes of Morbidity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Traffic injuries</td>
<td>18.9</td>
</tr>
<tr>
<td>2</td>
<td>Depressive disorders</td>
<td>11.3</td>
</tr>
<tr>
<td>3</td>
<td>Osteoarthritis</td>
<td>8.9</td>
</tr>
<tr>
<td>4</td>
<td>Falls</td>
<td>5.8</td>
</tr>
<tr>
<td>5</td>
<td>Substance abuse</td>
<td>5.5</td>
</tr>
<tr>
<td>6</td>
<td>Infertility</td>
<td>5.4</td>
</tr>
<tr>
<td>7</td>
<td>Psychotic disorders</td>
<td>4.4</td>
</tr>
<tr>
<td>8</td>
<td>Rheumatoid arthritis</td>
<td>4.4</td>
</tr>
<tr>
<td>9</td>
<td>Cataract</td>
<td>3.9</td>
</tr>
<tr>
<td>10</td>
<td>Diabetes mellitus</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td>Total of top 10 causes</td>
<td>78.1</td>
</tr>
</tbody>
</table>


*Note:* Ranked by Percentage of Years Lost Due to Disability.

Major causes of mortality and morbidity impact differently across age groups (Figure 2-14). Accidents and suicides are more prevalent among the youth, whereas cardiovascular diseases are more significant contributing factors of life lost among those over 50 years. This differential signals that implementation of age group specific public interventions will be important for mitigating risk factors. In particular, higher suicide rates and accidents among the youth are alarming. Injuries and psychosomatic illness affect adversely the quality of life and productivity throughout the life cycle. At the same time, risk factors associated with habits or life style, such as smoking, sedentariness, and reckless driving, require intervention early. Most smokers begin before 20 years of age, for example.

The youth bulge currently observed in IR Iran presents a demographic opportunity: its economy can benefit from the potential high productivity of the young. However, failure to act on needed preventive interventions may manifest as a drain on growth later.

**Figure 2-14: Important Causes of Years of Life Lost by Age of Population**

Over time, increasing morbidity of chronic diseases will place greater demand on the health system, straining the existing structure and resources available in the sector. This could be exacerbated if prevention efforts are ineffective with youth, who are at relatively greater risk of mental disorders, accidents, obesity, and smoking. The risk may potentially cause chronic health conditions later in life. More patients could present in more severe and symptomatic states to the health system, necessitating more expensive secondary and tertiary services, and increasing health care expenditures. An important challenge thus emergent will be containing costs without compromising quality of care, by increasing efficiency of health service delivery and employing cost-effective interventions.

Health Service Delivery System

Founding Principles

In the period immediately after the Islamic Revolution in 1979, the health system in the rural areas rapidly developed: benefiting from ‘Reconstruction Jihad’ which began in 1979 and aimed at rebuilding and resourcing the village health centers (Willis and Taghipour 2005). The endorsement of the Alma Ata Declaration by the Council of Ministers and the Consultative Assembly in 1984 further catalyzed investment in primary health care (PHC) and despite resource constraints imposed by the Iran–Iraq War, led to the development of an extensive PHC network.

The health system created after the revolution emphasized a number of principles, including:

- Preventive care as a long-term asset;
- Rural and underprivileged areas, with special attention to high risk groups;
- General practice over specialized medical care;
- Outpatient over inpatient care;
- Integration of preventive and curative services; and,
- Decentralization, aimed at creating sustainable regional and local infrastructure (Shadpour 2000).

Health care services in IR Iran are provided by public, quasi-public, and philanthropic organizations and a large network of private providers. The Ministry of Health and Medical Education (MOHME) is responsible for managing the public sector health organizations, as well as the regulation of the provision of private sector health services. The Ministry is also responsible for the planning and management of medical education through a unified structure that brings together the health network and the 39 medical schools and universities in a single management arrangement. The medical schools, in turn, are responsible for delivering hospital and primary care services to the population in their provinces (Samavat 2004).

Primary Health Care

The public (led by the MOHME) health care delivery system, which is the main provider of health services in IR Iran, places strong emphasis on PHC emphasis and is organized in three tiers: tertiary, secondary and primary health care services (Figure 2-15). The delivery system is based on a cascade system that builds on a very well established primary health care (PHC) network, with the provincial

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4 In 1985, with the approval of the Islamic Consultative Assembly, institutes involved in training medical and paramedical staff were separated from the Ministry of Higher Education and attached to the Ministry of Health. The latter became the Ministry of Health and Medical Education (MOHME). This was conducted in order to align the training needs of human resources in health with available resources and national priorities.
medical university overseeing the provision of health care in the entire province. The Iranian health care system is decentralized, with authority at the provincial level. However, there is very little decentralization of authority beyond the provincial level, except for the PHC network. This network is administered at the district level by district health centers (DHC), with one DHC in each district. Each DHC has one affiliated Behvarz Training Center. The DHC is responsible for planning, programming, and monitoring of health services at the district level. It is accountable to the provincial medical university, which plans, implements, and monitors health programs in the province.

Figure 2-15: Structure of the Health Care Delivery System

![Diagram of the Health Care Delivery System]


Note: Private health care delivery is not illustrated above.

The PHC network in IR Iran is quite elaborate and is comprised of several units, with the basic building block being the health house (Box 2-2). In rural areas, the health house is usually the first point of contact for basic primary health care, serving an estimated population of 1,500 people. The next level comprises the rural health centers (over 2,300), which provide ambulatory primary care services. Each rural health center covers about 7,500 people. These are staffed by medical doctors (usually general practitioners) who are recent graduates. Up to 90 percent of the rural population has access to PHC services delivered by health houses and rural health centers.
Box 2-2: Rural Health Care Network

The rural health care network in the Islamic Republic of Iran is the cornerstone of the country’s health care system. The network evolved out of a series of pilot projects that were conducted in the early 1970s as part of an effort to find the best system for expanding medical and health services in rural areas. The result was the establishment of rural “Health Houses,” based on the idea that vaccine-preventable diseases, acute respiratory infections, and diarrheal diseases could be addressed by making simple technology and information available to even minimally trained personnel.

There are now more than 16,000 Health Houses in Iran, covering around 95 percent of the rural population; mobile clinics bring health services to people living in remote areas. Each Health House serves around 1,500 people, usually consisting of the people of one central village where the health house is located, and those of satellite villages that are within an hour’s walk. Each Health House generally has two health workers (in principle, one woman and one man, though in practice there are typically two women as 75 percent are female), known are behvarzes, who are local residents and receive two years of training. The female behvarz is in charge of maternal and child health care and family planning, and the male is responsible for vaccinations, environmental health promotion, such as water safety and agricultural production, and home visits.

Behvarzes are proactive and are known to be willing to knock on people’s doors to discuss health care needs and to help set appointments to visit Health Houses. At the beginning of each Iranian calendar year (March 21), the behvarzes carry out a population census of the village for which their Health House is responsible. They collect age and sex profiles and put summary tables of these data on the wall of the Health House monthly. The collected data include the number of children who have been born in a particular calendar year, immunization coverage, number and cause of death, number of women in reproductive age, and prevalence of various contraceptive methods.


The next level is the district hospital, which is a general hospital providing secondary care and, in some cases, tertiary care. It is located in urban areas and has several specialties in-house including surgery, pediatrics, general medicine, and obstetrics and gynecology. Some hospitals may have more specialties. Tertiary care is provided by provincial hospitals in cities that serve as district headquarters.

The Universities of Medical Science are apportioned to at least one exists in each province, and play an important role both in medical education and provision of health services. Ultimate responsibility for the organization and delivery of health services within the province lies with these organizations. The chancellor of the medical university, who also serves as executive director of provincial health services, is accountable for all district health centers and hospitals. The medical universities, in turn, report to the MOHME at the national level.

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5 Initially, this arrangement was such that at the provincial level, the Universities of Medical Sciences were responsible for training personnel while regional health organizations undertook service delivery functions. The chancellor of the Medical Sciences University in each province would also head both the University of Medical Sciences and the regional health organization, with the managing director of the regional health organization as the alternate. This arrangement was not successful as the level of cooperation required for it to be effective did not materialize. In 1994, a decision of the Minister of Health’s Council of Deputies led to the merger of the two institutions and the creation of the Universities of Medical Sciences and Health Services Universities. The Universities of Medical Sciences are responsible for delivering health care to the population within their catchment areas. In addition to their academic units, these organizations have two systems for service delivery, namely PHC networks and public hospitals. The PHC network is responsible for delivering PHC to all individuals in the catchment area, both rural and urban. Public hospitals provide acute curative care at the primary, secondary, and tertiary levels.
District health centers coordinate the urban and rural PHC network (Figure 2-15 above). The urban equivalent is the urban health post (1,176 in IR Iran), which is responsible for provision of vaccination and MCH services in the urban areas. Women health volunteers in the urban health posts play a role akin to that of the behvarzes. There are over 2,300 urban health centers (UHCs), each covering a population of around 15,000 people. These UHCs are staffed by a minimum of three general practitioners and 15 health workers. In larger cities these are complimented by 600 urban health posts (UHPs), each of which covers a population of around 10,000 people living in poor areas and provides public health and preventive (but not curative) services. The UHPs are each staffed by five health workers; the health workers are assisted by around 50,000 female volunteers, who support the provision of public and environmental health education, family planning, pediatric development, and immunization (Asadi-Lari 2004).

Hospitals and Secondary Level Services

The next level in the public health service is the district hospital, which is a general hospital providing secondary care and in some cases, tertiary care. It is located in the city and has several specialties in-house including surgery, pediatrics, medicine, and obstetrics and gynecology. Some hospitals may have more specialties. Tertiary care is also provided by provincial hospitals in those cities that serve as district headquarters. Health service delivery by the public hospitals at the secondary level is coordinated by the district health center.

In spite of this well-defined organizational structure, the referral system up to secondary and tertiary services does not always work well. It is not uncommon, particularly in urban areas, for patients to bypass health posts and urban health centers and present directly at the district hospital or to specialists in private hospitals. In the rural areas, the assumption is that approximately 80 percent of patient needs presented to health houses will be met, and about 20 percent will need referrals to higher levels such as rural health centers. Beyond this level, the “referral system” has been problematic. This referral system has not been systematically evaluated to ascertain what proportion of patients seen in the health houses/posts are referred, or the proportion of patients presenting at higher levels with problems that could have been addressed at lower tiers of the system. The health system also lacks feedback or counter-referral mechanisms to the referring centers.

The delivery system has, over time, also become much more complex, and comprises more than the MOHME facilities and infrastructure. The current health care delivery system can be described as a composite of three organizational forms: hierarchal bureaucracies, long-term contractual arrangements, and short-term market-based interactions between patients and provider. The structure of the public health care delivery system and Social Security Organization (SSO) medical facilities is an example of the first structural form. Founded in 1952, the SSO is the second largest insurer and provides coverage for 26 million people, mainly formal private sector workers. However, it also has its own network of providers (i.e., 76 hospitals and 270 clinics as well as contracts with providers outside its network), an estimated 44,000 providers (MOWSS November 2005). There is no private provision with this kind of insurer–payer–provider structure, although some physician cooperative corporations are beginning to appear. Long-term contractual arrangements under some degree of nonmarket control are also present in the national health system. An example is the purchaser–provider interaction between insurance companies (including SSO) and the public, not-for-profit and private hospitals, physicians, paramedical facilities, and pharmacies.

In recent years, the number of hospitals operated by the MOHME, the private sector, and charitable trusts has increased (Figure 2-16). In 2007, there were 801 operating hospitals. Of these, 532 were affiliated with the MOHME (operated by the provincial Universities of Medical Science), 115 with private sector operators, and 154 in other sectors such as the Bank Melli Iran, the National Iranian Oil Company,
National TV and Radio Networks, charitable trusts, and other ministries (e.g., the Ministry of Education and the Ministry of Social Welfare).

**Figure 2-16: Trends in Number of Operating Hospitals (1986–2007)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>MOHME</th>
<th>Private</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1991</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: MOHME (2007).*

Public hospitals are accessible to those who pay premiums to and are covered by the Social Security Organization (SSO) and the Medical Services Insurance Organization (MSIO). However, despite a recent expansion in bed capacity, insufficient funding for the public health sector has led to long waiting lists and inadequate maintenance in public sector hospitals. Consequently, in large cities, many use private hospitals, and often pay out-of-pocket at the point of use.

**Health Financing**

In 2005, the government reported that the total health expenditure of the country was Rls 127 trillion. The country’s total health expenditure accounts for 7.8 percent of GDP, which is equal to USD 205 per capita ($788 in international dollars.)

The health care financing system, like the delivery system, is pluralistic and is organized through a number of public and nonpublic insurance schemes. Insurance schemes have developed in some parallel over time. Access to services and choice of provider is determined largely by the type of insurance coverage. There are several insurers each with a different benefits package, creating a complex maze of co-payments and referral and counter-referral systems.

In 1994, the Public Medical Service Insurance Act was adopted. This established the Public Medical Service Insurance High Council within the Ministry of Health and Medical Education (MOHME) and the Medical Service Insurance Organization — as a legally independent organization affiliated to the MOHME. The Act also stipulated that government agencies, organizations, and persons could contract with an insurance organization of their choice but the organizations involved in providing medical insurance had to comply with the approved per capita premium payable by the insured. The Act stipulated the entitlements of the insured and coverage for groups unable to pay insurance premiums, with regard to health services and drugs and to sub-specialized medical services for which additional medical insurance was necessary (Decree No. H/14861t/21778, 1997). In 2006, the Insurance High Council was moved to the newly established Ministry of Social Welfare.
The Medical Services Insurance Organization (MSIO) is the largest insurer and provides coverage for around 33 million people, mainly civil servants, the self-employed, rural populations, and special groups such as students, clergymen, and patients suffering from specific illnesses (e.g., chronic renal failure and thalassaemia major). It is largely financed through general tax revenues. The Social Security Organization (SSO) is the second largest insurer and provides coverage for 26 million people, mainly formal private sector workers. Its network of providers was described above, and it is funded by a payroll tax shared by employer and employee. The Armed Forces Medical Services Organization (AFMSO) covers another 3.5 million people. Around 5.2 million persons who cannot afford to pay for insurance are covered by the Imam Khomeini Foundation (IKF). In addition, there are approximately 30 smaller health financing schemes for privileged or large organizations (e.g., government ministries, municipalities, banks, and cooperatives) providing coverage to the workers and their dependents.

In the public system, the health services at the primary health care (PHC) level are free at the point of delivery and are financed through budget transfers to the designated centers. Secondary and tertiary level services are primarily financed by the social security institutions and insurers. Payment systems to providers are complex, but an ongoing issue in the public sector is that medical fees have been set at artificially low rates and reimbursement mechanisms of insurance companies are often low and typically are not structured to encourage optimal provider performance. This somewhat dysfunctional arrangement has been thought to have the potential to fuel corruption and ‘under the table’ payments (Alaviyan 2006). So-called “spot market” payments at the point of service between individuals and private medical bodies are highly prevalent, with medical fees often reaching nearly 12 times the level of formal fees received by private medical bodies (Mesdaghinia et al. 2003).

In the past few years, the government has expanded coverage by over 23 million people under the new Rural Health Insurance program. Those insured under the Rural Health Insurance System (part of the MSIO) in villages and small cities with under 20,000 populations have the freedom to attend a public or private provider under contract with MSIO. The new rural health insurance program further upgrades providers to assure a family practitioner (FP) to everyone under the program. The MSIO beneficiaries, except for the rural households, incur a co-payment of 25 percent for outpatient and 10 percent for inpatient services. Rural households have to co-pay 25 percent of the cost of inpatient services, but have to pay in full the cost of outpatient services.

Persons covered by the IKF are able to access a closed system of PHC providers and hospitals contracted by the Welfare Committee of the IKF. These persons can attend a secondary care provider after a referral by a GP. When referred, there is no co-payment for inpatient services, whereas the co-payment for outpatient care varies between 0 and 30 percent of the cost, depending on the financial situation of the person. The cost of self-referrals has to be met out-of-pocket.

Beneficiaries of the AFMSO and some smaller funds, such as the Ministry of Oil, enjoy comprehensive health care benefits and incur no co-payment if they use the network of providers owned by these organizations. Those insured through other small closed insurance systems, such as those for the banks (e.g., Bank Melli Iran and Bank Sedaret), have coverage for a comprehensive set of diagnostic and curative services but have to co-pay between 0 and 20 percent of the costs of outpatient services and between 0 and 35 percent of the cost of inpatient services, depending on the fee schedules set by the insurer.

**Pharmaceutical Sector**

Before 1979 the Islamic Republic of Iran had a thriving domestic drug industry that was dominated by foreign ownership. After the Islamic Revolution, the new leaders expropriated the previous owners and
the state took over the industry. Radical changes were made, leading to centrally controlled manufacturing of purely generic drugs in a planned economy context.

The current pharmaceutical policy is guided by a National Drug Policy document (MOHME 2004a). The administration favors a generic drug policy, but there are provisions that provide limited protection for innovation if local investments are made. International patents are not recognized. National manufacturers are encouraged to introduce copies of patented medicines if the drug selection committee decides that these new medicines are important for the Iranian health system. Certain lifesaving or disease-modifying patented drugs that cannot be locally made are procured by the Ministry of Health and Medical Education (MOHME) and subsidized at an import level so that retail prices are much lower than in other countries. This creates incentives for smuggling these drugs out of IR Iran into other countries, where they can be sold at a profit.

The relative income levels and population of IR Iran makes it a significant pharmaceutical market. The size was about USD 1.5 billion in 2006 (at retail prices, excluding government subsidies). At the same time, the market is modest compared to some of its neighbors. The pharmaceutical market in neighboring Turkey (which has about the same population as IR Iran and a GNI per capita of USD 4,710 versus USD 2,770 per capita using World Bank numbers (2007) is more than four times the size of the Iranian market (IMS 2005).

Through the primary health care system, patients have access to essential medicines at low costs. Insurance organizations have unified formularies and reimbursement systems, with co-payments per prescription. Outside the insurance formularies, there is a significant market for imported drugs that have to be paid out-of-pocket. The overall share of out-of-pocket payments for pharmaceuticals is estimated at 45 percent of the entire market (World Bank 2006).

Most of the drugs on the Iranian market today are locally manufactured (95 percent in volume, 72 percent in value) (Nikfar et al. 2005), at about 60 different manufacturing sites belonging to five large public holdings and several smaller privately owned companies. Access to markets and product prices in the Iranian pharmaceutical market are regulated. The local industry is protected against foreign competition by tariffs up to 90 percent on imported drugs.

Counterfeit drugs have been discovered in certain areas; IR Iran is a major transit country for the illicit narcotics trade (see Section 3 for further discussion). The transit pathways can be used for other illegal goods as well. Fake drugs have similar profit margins as narcotics but carry a much lower risk of prosecution and punishment. Understanding the size of this problem and developing a defense strategy against it is one of the priorities of the MOHME. During the last two years, the MOHME has been able to significantly control the unofficial pharmaceutical market by facilitating registration of certain products. This has specially affected counterfeit vitamins and food supplements that accounted for a large proportion of counterfeit market.

**Dimensions of Performance: Sectoral Challenges**

The Islamic Republic of Iran has demonstrated impressive progress in health status and development of the health sector over the last two and one-half decades. Following the Islamic Revolution investments in public health led to provision of clean water, better hygiene, and sanitation. This was combined with the development of a basic but strong rural primary health care system. Broad population coverage with social insurance has improved access and accessibility to health services for over 90 percent of the population. The ‘Master Health Plan’ for the period 1983–2000 encouraged a shift of resources from tertiary and curative services to PHC and targeted high risk populations in the deprived areas of the
country. In particular, the presence of behvarzes, which are embedded in the community, has helped improve local inclusiveness in decision making (though in urban areas, there is limited involvement of communities in decision making). IR Iran now has a good network of PHC facilities, with particularly good coverage in most rural areas. Collectively, these changes contributed to IR Iran’s success in improving the health status of its population.

Despite the successes, challenges remain both in terms of health outcomes and systems performance. Globally, middle income countries exhibit similar patterns of development and challenges. These include at a macroeconomic level: poverty and patterns of income inequality, issues of labor mobility, job creation, and employment. At a health sector level, countries face differing paces of demographic and epidemiologic transition. Health coverage is uneven, with inequitable and ineffective financing systems that rely on large out-of-pocket expenses. There is development of a public and private sector, but these not fully integrated; there is duplication and inefficiencies in delivery system. IR Iran, to some extent, fits these patterns.

Outcomes relative to expenditures seem to have started reversing in recent years, as presented in Figures 2-17 and 2-18. These show relative outcomes and expenditures, both total and government only. It compares expected outcomes given the funds spent and compares IR Iran with other countries in the world. In each case, outcomes are reversing even while expenditures are increasing on a relative basis with other countries. This suggests drops in efficiency and outcomes. Even though it is only a four year time span, it may signal a negative trend in IR Iran relative to other countries in the world.

Reductions in average IMR figures mask the inequities that exist. An analysis of the Demographic and Health Survey that was conducted in IR Iran in 2000 shows over twofold variation in the estimated infant mortality levels in the poorest quintile (47.2 per 1,000 live births) and the richest quintile (20.7 per 1,000 live births), with a reverse association between infant mortality rates and socioeconomic status: with a reverse gradient from richest to poorest (Hosseinpoor et al. 2005).

**Figure 2-17: Under-Five Mortality and Total Health Expenditure (2000–2004)**

![Diagram showing under-five mortality and total health expenditure](image)

*Source: WDI (2007) and UNICEF (2007).*
Figure 2-18: Under-Five Mortality and Government Expenditure on Health (2000 and 2004)

While the inequality of infant mortality favors the better-off throughout the country, the inequality varies across provinces. Some provinces have low averages of IMRs but have high inequality within the province, such as Khuzestan and Mazandaran (Figure 2-19). Provinces with high infant mortality averages and high inequality are Zanjan and East Azerbaijan. Grouping provinces on the basis of the average infant mortality to the concentration index, Khuzestan is seen to have a low average but high inequality, and Khorasan has a high IMR average and high inequality (Figure 2-20).

Figure 2-19: Infant Mortality by Province: Lowest to Highest Quintiles Odds Ratio

Source: Hosseinpoor et al. (2005).

6 The concentration index, whose value can vary between -1 and +1, is frequently used in measuring income-related inequalities. Its negative values imply that the health variable is concentrated among disadvantaged people while positive numbers imply that the health variable is concentrated among the rich. When there is no inequality, the concentration index is zero (Hosseinpoor et al. 2005.)
The availability of health houses also is unequally distributed: only 72.3 percent are covered by the health houses in the province of Sistan-Baluchestan and 75.6 percent in Ghazvin, while the national average was 90 percent (1999). Markazi province has a high concentration of infant mortality among the poor, despite the availability of health care delivery for almost all its people. However, the correlation between the average infant mortality and availability of health care is not high across provinces.

Figure 2-21 shows disparities in the 1–59 months mortality rate in rural areas covered by health houses in 2001 for the same province of Kerman (40 deaths per 1,000 live births) and Sistan-Baluchestan (23 deaths per 1,000 live births), in comparison to the national average of 13 deaths per 1,000.

Figure 2-21: Mortality Rate 1–59 Months in Rural Iran Covered by Health Houses (2001)

7 The same provinces also face increasing numbers of tuberculosis and HIV cases due to the influx of refugees from Afghanistan and incoming opium, instigating intravenous drug use and needle sharing among the population, where HIV is likely to be transmitted. In terms of access to deliveries assisted by trained health personnel, only 55 percent of rural Sistan is covered while seven other provinces reach over 98 percent coverage (MOHME 2003). Under-five mortality rates are the highest in rural Sistan-Baluchestan with 45 per 1,000 live-births as compared to Tehran where the rate is 15 per 1,000.
At present, the Ministry of Health and Medical Education is addressing the issue of disparity in health outcomes by promoting decentralization of health service delivery (Box 2-3). Overall, there is very limited knowledge regarding health inequality and its determinants.

The Islamic Republic of Iran still has one of the highest under-five malnutrition rates in the Middle East and North Africa Region (World Bank 2000). The Anthropometric Nutritional Indicators Survey in 1998 showed that one out of every nine children less than five years of age was below the weight required for this age, attributed to malnutrition and metabolic problems, with a prevalence of underweight children in rural areas (13.7 percent) to be higher than that in the urban areas (9.6 percent). According to the World Health Organization, Global Database on Child Growth and Malnutrition, the under-five malnutrition level in 1995 was 15.7 percent (WHO 2006d). In the periods 1995–2001 and 1996–2004, UNICEF estimates show that the proportion of under-five children with moderate-to-severe malnutrition and moderate-to-severe stunting were 11 percent and 15 percent respectively. These malnutrition levels were higher than the regional average level of 14 percent for Middle East and North Africa Region, while the stunting levels were lower than the regional average of 22 percent (UNICEF 2003).

Malnutrition is taken up again in Section 3.

**Box 2-3: Decentralization in IR Iran**

<table>
<thead>
<tr>
<th>A policy goal of the Government of the Islamic Republic of Iran is to transform the health system from a relatively centralized bureaucracy to a functional decentralized system, by placing decision making closer to the point of service. The major objectives for decentralization of the health system are to increase service delivery effectiveness through adaptation to local conditions and targeting to local needs; improve efficiency of resource utilization by incorporating local preferences into determination of service delivery; increase cost-consciousness and efficiency of service production through closer links between resource allocation and utilization; and increase health worker motivation through local supervision and involvement of service users in oversight and performance assessment (Rahbar 2006). Decentralization is seen as an approach to better inform local leaders about local problems and available resources, and to empower them to make better decisions based on local community health status, health related risk factors, utilization rate, and resource availability. Decentralization is seen as one approach to address disparities in health outcomes among the different provinces and across levels of income for traffic accidents, cardiovascular diseases, diabetes, and child mortality rates. It is also seen to address differences in levels of the provision of services and the utilization rates across provinces. Decentralization in the Iran’s health sector has been slow. So far, health care provision and managerial issues have been delegated to the provincial level. An experimental model of hospital autonomy is being tested in one of medical university hospitals in Tehran (see Section 5). Moreover, a study was conducted on increasing autonomy in health services provision to urban areas. Challenges remain like, limited tangible experience in decentralizing health service provision, legislative opposition to the program, lack of managerial capacity, and shortage of financial resources.</th>
</tr>
</thead>
</table>

There also are challenges in the financing and delivery of services. Despite policies supporting universal coverage, there is a gap that ranges between 10 percent and 25 percent of the population. This applies, in particular, to rural areas and among informal sector workers and their families. The public sector health delivery system lacks a full incentive and accountability structure, and there are indications that the current government-managed health services do not provide adequate financial protection to individuals in the event of a catastrophic illness or injury or for chronic diseases. Over 3 percent of families suffer
from catastrophic health care costs at any one point in time. Of this group, only an estimated 35 percent have insurance coverage. Out of the total health care resources, only 7 percent is earmarked for primary care while over 50 is spent on secondary and tertiary services.

In IR Iran, as in other countries, government run health services remain susceptible to bureaucratic failure problems and are not always able to deliver efficient and high quality services. With increasing demands for more complex medical interventions, the gap between the outdated public administrative structure and the management requirements of a high technology service sector is growing. Efforts have been made to improve the performance of the public sector by contracting health services through private health care providers, and by creating of internal markets within the public sector to enhance accountability and create incentives for better performance.

The continuing monopoly of state run services and inadequate regulatory systems are squeezing out private investments in potentially one of the most important service sectors that could generate economic growth. There is an active and growing private health sector which remains largely unregulated and whose functions and roles are neither well defined nor included in the national development policies and programs. Unregulated growth (e.g., sales of unregulated pharmaceuticals) could exacerbate risks to the general public in terms of quality and safety of the services. New regulatory systems, institutional capacities, and governance may be needed to improve the performance of the public sector programs and to establish an enabling business environment that will promote the growth of vibrant private health sector.

The pharmaceutical sector presents one such example of this needed transition. Policies have turned away from the current level of protection and subsidy back toward the introduction of market mechanisms, private ownership or “corporatization” of publicly owned companies, and favoring of branded generics, thus allowing companies to market their products in competition with each other. The pharmaceutical sector would appear to be in transition from a policy focused on equal access to a basic standard of care to a policy of a more differentiated nature: maintaining a system that ensures access of the poor to a good quality basic package of medical care, while at the same time increasing the choices for the wealthier part of the population – those who are willing to pay extra for convenience or perceived higher standards. It is further attempting to create conditions that allow the national industry to make the investments and strategic choices necessary for survival in a more open market.

The challenges presented here are illustrative but by no means exhaustive. The following sections examine and address these and other issues and challenges in more depth.
Section 3
Public Health
Evolution of Public Health Sector

The overview of the health sector in the last section included a review of the current patterns of disease in the population, the changing patterns over time, and expected trends into the future. Public health programs are established as a basic first level of support for the population and typically linked with the aspect of public good and have strong externalities in improving the health of the individual but also the broader population.

Box 3-1: Summary Points

The predominance of the “diseases of youth,” non-communicable diseases (NCDs), and injuries in the disease profile of the Iranian population suggests the urgent attention to manage and prevent the onset of these preventable diseases and risk factors.

Solutions will require reconfiguration of the government’s public health functions and a new set of public health interventions. The array of government efforts required to tackle these challenges include integration of non-communicable diseases into a disease surveillance, promoting behavioral research to gain an in-depth understanding of social determinants of health outcomes (e.g., mental health and substance abuse issues), and linking analysis with health policy formulation and implementation.

It is also essential that the Ministry of Health and Medical Education (MOHME) provide the leadership to curb emerging disease burdens by enacting essential public health laws and policies, such as with tobacco usage.

The government should strengthen intersectoral coordination to tackle alarming health issues such as traffic accidents and air pollution. Collaboration by the MOHME with the key implementing institutions (e.g., the Ministries of Education, Transport, Environment, and Justice) has become crucial to coordinate action for prevention of non-communicable diseases, road safety, air pollution reduction, and health outcome disparities.

The economic costs of public health issues and the burden of disease are significant, up to 10 percent of GDP if taken together.

Public health activities traditionally include assessing the health status of a population, diagnosing problems, identifying causes of observed health outcomes, and identifying solutions to improve the health status of the population (M. Schneider 2006). In IR Iran, the evolution of the public health sector is intertwined with primary health care (PHC) and flourished with the expansion of PHC networks, starting from the 1980s. The PHC program is outlined in more depth in Section 4. The concept of the PHC in IR Iran consists of

- Focus on preventive care rather than curative care;
- Provision of community health care in underserved areas;
- Integration of basic health services;
- Community participation; and
- Periodic surveillance by community health workers.
These activities are a part of the essential public health functions that a government is expected to perform.

Through expansion of the PHC program, the Iranian public health sector successfully developed a basic infrastructure for disease surveillance and health education and promotion. The expansion also created communicable disease controls and provision of basic health services. As a result, over the last twenty years IR Iran achieved an overall improvement in the population’s health status and in particular, controlled communicable diseases both in urban and rural areas.

Today, with rapid industrialization, urbanization, and an aging population, the Iranian public health sector faces a new set of challenges that are more complex and structural than several decades ago. As noted in the last section, non-communicable diseases (NCDs) including depression, drug addiction, cancer, and heart disease cause the larger part of disease burden in IR Iran. These burdens of disease are strongly associated with high levels of risk factors such as, hypertension, diabetes, and obesity. Many of the non-communicable diseases can be interlinked, and one disease can lead to another. At the same time, the increase of HIV/AIDS presents an alarming threat to the society. The HIV infection continues to spread to IDUs, their sexual partners, prisoners, and possibly to Iranian youth.

The following sections focus on the public health programs and traditional public health functions implemented by the government and nongovernment organizations for reducing burden of diseases and mitigating risk factors. Successes and ongoing challenges are reviewed, as are health and nutrition activities, particularly for mothers, infants, and young children.

**Non-communicable Disease Prevention Programs**

Behavioral change and public health interventions for mitigating risk factors play an increasingly important part in mortality and morbidity. Types of risk factors in IR Iran vary widely, encompassing risk factors related to individual’s lifestyle to environmental or occupational risks. Similarly, micronutrient deficiency, such as anemia, is still surprisingly prevalent among the Iranian population, namely among women and children. Among others risk factors, obesity ranks first in terms of burden attributable to risk factors (Table 3-1). This is followed by hypertension, inadequate physical activity, high cholesterol, substance abuse, unsafe water/unsanitary toilets, stress, anemia, smoking, and diabetes (Naghavi 2003). Obesity is linked with multiple diseases such as, cardiovascular disease, hypertension, diabetes mellitus, cancers of breast, colon, and kidney, and knee arthrosis.

**Prevention of Accidents and Injuries**

Traffic injuries comprise the number one burden of disease in the country, with the highest number of disability-adjusted life years (DALYs) accrued for the population. The seriousness of traffic accidents is well recognized in IR Iran. However, the government's interventions need further strengthening (World Bank 2004).

Enforcement of laws and regulations is problematic with regard to road safety, as the main attention of the police is too often to facilitate traffic flow, with less vigilance on hazardous driver behaviors. Raising the level of awareness of road users regarding accidents and injury prevention (e.g., speed reduction, mandatory use of seat belts and helmets, and safe pedestrian behavior) will require educating drivers, pedestrians, and schoolchildren as well as police enforcement of reckless driving behaviors. In addition, improved road design (e.g., speed bumps, road signs, and markings) should be an ongoing prerequisite to a successful strategy. Once accidents occur, the lack of adequate medical facilities, including limited emergency services, and a general lack of qualified medical personnel have traditionally impeded prompt
medical attention. More ambulances, hydraulic equipment, and better communication equipment for emergency services have recently been procured, but more may be in need in rural Iran as emergency and rescue centers often do not have adequately functioning communication facilities.

Table 3-1: Burden Attributable to Risk Factors: Iranian National Burden of Disease Study (2003)

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Burden Attributable to Risk Factor (DALYs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Obesity and overweight</td>
<td>439,878</td>
</tr>
<tr>
<td>2 Arterial hypertension</td>
<td>349,559</td>
</tr>
<tr>
<td>3 Inadequate physical activity</td>
<td>298,666</td>
</tr>
<tr>
<td>4 Hypercholesterolemia</td>
<td>264,627</td>
</tr>
<tr>
<td>5 Substance abuse (as a risk factor)</td>
<td>240,355</td>
</tr>
<tr>
<td>6 Unsafe water or unsanitary toilets</td>
<td>168,337</td>
</tr>
<tr>
<td>7 Ergonomic stressors</td>
<td>146,390</td>
</tr>
<tr>
<td>8 Anemia (hemoglobin &lt; 11mg/dL) (as a risk factor)</td>
<td>99,013</td>
</tr>
<tr>
<td>9 Smoking (all types)</td>
<td>84,653</td>
</tr>
<tr>
<td>10 Use of solid fuel and indoor smoke</td>
<td>70,770</td>
</tr>
<tr>
<td>11 Diabetes mellitus (as a risk factor)</td>
<td>50,542</td>
</tr>
<tr>
<td>12 Occupational exposure to particles inducing chronic obstructive pulmonary disease</td>
<td>46,089</td>
</tr>
<tr>
<td>13 Inadequate intake of fruits and vegetable</td>
<td>21,102</td>
</tr>
<tr>
<td>14 Improper use of modern contraceptive methods and their failure, use of traditional methods, and not using contraceptive methods</td>
<td>19,574</td>
</tr>
<tr>
<td>15 Alcohol</td>
<td>11,304</td>
</tr>
<tr>
<td>16 Low birth weight (mild, moderate, severe) (as a risk factor)</td>
<td>9,067</td>
</tr>
<tr>
<td>17 Not using breast-feeding or improper use of it</td>
<td>7,244</td>
</tr>
<tr>
<td>18 Unsafe sex</td>
<td>6,103</td>
</tr>
<tr>
<td>19 Occupational exposure to asthma-inducing material</td>
<td>5,733</td>
</tr>
<tr>
<td>20 Vitamin A deficiency (mild, severe)</td>
<td>5,486</td>
</tr>
<tr>
<td>21 Not using complementary folic acid during pregnancy</td>
<td>3,232</td>
</tr>
<tr>
<td>22 Zinc deficiency</td>
<td>2,790</td>
</tr>
<tr>
<td>23 Adult underweight (BMI &lt; 20 Kg/m2)</td>
<td>2,205</td>
</tr>
<tr>
<td>24 Occupational exposure to material increasing risk of leukemia</td>
<td>640</td>
</tr>
<tr>
<td>(benzene, ethylene, oxide) and ionizing radiation</td>
<td></td>
</tr>
<tr>
<td>25 Occupational exposure to material increasing risk of lung cancer (arsenic, asbestos, borelium, cadmium etc.)</td>
<td>413</td>
</tr>
<tr>
<td>26 Air pollution (only for YLL estimate)</td>
<td>359</td>
</tr>
<tr>
<td>27 Tattooing</td>
<td>60</td>
</tr>
<tr>
<td><strong>Total DALYs attributable to risk factors</strong></td>
<td><strong>2,354,191</strong></td>
</tr>
<tr>
<td><strong>Total DALYs (due to all disease and injuries)</strong></td>
<td><strong>14,374,164</strong></td>
</tr>
</tbody>
</table>


8 The Second Primary Care and Nutrition project, to run through September 30, 2008 has allowed for procurement of around 500 ambulances utilizing Bank and Government funding.
A number of campaign television spots on safety issues have been carried out by the police, and some promising initiatives concerning the education of schoolchildren have also been launched as demonstration projects. According to the MOHME’s Injury Prevention Unit, they have initiated the “Safe Community” models (WHO 2007) to prevent injuries and road accidents in a committed community setting. Initially starting with five cities, the model has now expanded to 40 cities in the country, with plans to expand to 125 cities by 2011. For the international event on “Safe Communities” that was held in June 2007, three Iranian cities were chosen as model communities. In late 2005, in collaboration with the Ministry of Road and Transport and the MOHME, the National Road Safety Commission was formed; it meets once a month to check on the progress of the rollout of the Road Safety Action Plan. And, although it has yet to create a national education program that is systemically coordinated, it has gathered information on all of the institutions involved in road safety. First analysis indicates that neither within the institutions nor across the police and the different ministries are activities coordinated. In some instances, several institutions are providing parallel or duplicative interventions without coordination; in other cases implementation follow up is lacking. Effective intersectoral coordination would be pivotal for successful prevention of road accidents.

Prevention of Cardiovascular Disease

After accidents and deaths caused by natural disasters (Yusuf et al. 2001), cardiovascular diseases (CVD), namely ischemic heart disease and cerebrovascular diseases, are the third and fourth highest ranking category of causes of death. Hypertension, or high blood pressure, and smoking are the leading risk factors for CVDs.

Prevention of Hypertension. Hypertension is a key modifiable risk factor for cardiovascular disease, and it serves as an important public health indicator to reveal high frequency and concurrent risk of cardiovascular diseases (Kearney et al. 2005; Poulter 2003). A full 20 percent of men and 17.3 percent of women in IR Iran were found to have hypertension in 2005, an average of 18.6 percent overall (CDC 2005). The level reached as high as 40–59 percent among women aged 45–64 years old in 2005 compared to 18.5 percent for women aged 40–69 years in urban areas in 1990.

Hypertension is caused by multiple factors, some of these being poor diet (i.e., high consumption of energy dense foods with high concentrations of fat and carbohydrates), smoking, lack of exercise, and high intake of salt, among others. The burden of hypertension may suggest an intervention to increase awareness, treatment, and control but also concerted efforts to change behaviors toward healthier lifestyles.

Since 1992, the MOHME initiated the “National Plan for Prevention and Control of Hypertension,” screening adults over age 30 by detecting, controlling, and treating hypertension in rural areas. Hypertension control appears to be well integrated into the primary health care services.9

Tobacco Control. Smoking, another leading risk factor for cardiovascular diseases, is prevalent among 21 percent of men aged 15–64, while 3 percent of women smoke (CDC 2005). According to the latest study (1999), 12 percent of those over 15 years old are smokers. Iranian smokers tend to start smoking at an early age: an estimated 67 percent of Iranian smokers started at the age of 14 years old. Average consumption is 13.6 cigarettes per day. In addition to cigarette smoking, Iranians smoke a water pipe, called a qelyon. Comparing two studies from 1991 and 1999, qelyon smoking has increased from 0.8 to 1.4 percent among the age group 15–24 years old. These figures overall, if relatively stable since 1999,

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9 Hypertension control was well integrated into the system, as observed during the visit to the rural health house in Shariar district in January 2007. Individuals have their blood pressure measured, usually are provided counseling by the behvarzes, and are provided medication when required.
are comparable to the reported prevalence of smoking in the European region, where the smoking epidemic has been curbed in the recent past. In the EU-15 countries for 2005, smoking is prevalent across 29 percent of the adult population, including 40 percent of males and 18 percent of females (WHO 2007).\textsuperscript{10}

The Government of the Islamic Republic of Iran promulgated a law in 1997 banning tobacco advertising, and also banned tobacco consumption and sales in food preparation and distribution centers. The Iranian government is piloting a tobacco consumption ban in public places in four designated areas, supervised by the medical universities. Thus far, available statistics show that the prevalence of smoking has not been curbed. Before smoking levels rise further, the government could consider a nationwide ban of smoking in public places and a detailed action/implementation plan for smoking prevention measures. At the same time, the introduction of a tobacco tax could be considered because it effectively reduces the affordability of cigarettes, especially for susceptible teenagers. For example, a cross-sectional population-based study in Germany found that after the tobacco tax increase, 4.0–7.9 percent of the interviewed smokers quit smoking with a resulting 11.5–16.6 percent reduction in consumption (Hanewinkel 2007).

**Box 3-2: Effective Tobacco Control: Findings from Disease Priorities in Developing Countries**

According to Disease Priorities in Developing Countries, 2\textsuperscript{nd} Edition (DCP2), tobacco taxes aimed at raising the cost of smoking are the most cost-effective ways to reduce smoking. Studies show that 70 percent increase in the price of tobacco could avert 10–26 percent of all smoking-related deaths worldwide. This effect would be particularly strong in low and middle income countries, among young people, and for men. Taxes are also more effective in the long run than in the short run, because addicted consumers change their habits slowly. Higher tobacco prices appear to be particularly effective in preventing young smokers from moving beyond experimentation to becoming regular smokers. Using a base case scenario of a 33 percent price increase yields a cost-effectiveness ratio of USD 3 to USD 42 per DALY averted in low and middle income countries. Many governments are increasingly using tobacco tax policy to raise the cost of the habit and discourage the use of tobacco. In some cases, countries have even earmarked tobacco taxes to finance health programs aimed at reducing exposure to tobacco (e.g., Egypt, Turkey).

In addition to raising the price of tobacco, many countries have effectively discouraged smoking by restricting it in public areas. This forces smokers to change smoking habits and stigmatizes the practice, thereby inducing changes in social norms. To have an impact, such regulations require enforcement, particularly when first introduced. On the other hand, interventions aimed at reducing the supply of tobacco do not seem to be particularly effective. Some of these programs, such as prohibiting the sale of tobacco products to young people, are difficult and costly to enforce.

*Source: Jha et al. (2006).*

**Prevention of Overweight and Obesity.** Overweight and obesity are associated with raised blood pressure and cholesterol levels, and an increased risk of developing diabetes. Excess body fat accounts for about 60 percent of the global burden of diabetes and 20 percent of coronary heart disease. Major modifiable determinants of overweight and obesity are unhealthy diets and physical inactivity (Hossain et al. 2007). The latter is estimated to account for about one-fifth of the global burden of coronary heart disease.

\textsuperscript{10}The tobacco epidemic is, according to 2004 data, still expanding in developing countries, where seven out of 10 tobacco-related deaths occurred. But smoking rates are falling in developed nations. Among the population of the United States, smoking rates shrunken by nearly half in three decades (from the mid-1960s to the mid-1990s), falling to 23 percent of adults by 1997. By contrast, in the developing world, tobacco consumption is rising by 3.4 percent per year (WHO 2002a). Among WHO regions, the Western Pacific Region, which covers East Asia and the Pacific, has the highest smoking rate, with nearly two-thirds of men smoking.
Table 3-2 shows the prevalence of overweight and obesity in terms of body mass index (BMI) for both female and male adults. About half of the women (49 percent) and 37 percent of the men are classified as either overweight or obese. Approximately 71 percent of women aged 45–54, and 54 percent of men of the same age group are overweight or obese. For both men and women, age is positively associated with risk of being overweight. The prevalence of overweight and obesity increases as people age, however. The prevalence is already high among the youth aged 15–24 years old.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Overweight</th>
<th>Obese</th>
<th>Overweight</th>
<th>Obese</th>
<th>Overweight</th>
<th>Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td>15–24</td>
<td>14.7</td>
<td>4.2</td>
<td>19.3</td>
<td>6.3</td>
<td>17.1</td>
<td>5.2</td>
</tr>
<tr>
<td>25–34</td>
<td>31.0</td>
<td>9.0</td>
<td>33.6</td>
<td>18.9</td>
<td>32.3</td>
<td>13.9</td>
</tr>
<tr>
<td>35–44</td>
<td>37.3</td>
<td>12.9</td>
<td>37.0</td>
<td>31.5</td>
<td>37.1</td>
<td>22.1</td>
</tr>
<tr>
<td>45–54</td>
<td>39.3</td>
<td>14.7</td>
<td>36.4</td>
<td>34.8</td>
<td>37.8</td>
<td>24.7</td>
</tr>
<tr>
<td>55–64</td>
<td>37.1</td>
<td>13.8</td>
<td>36.0</td>
<td>31.0</td>
<td>36.6</td>
<td>22.3</td>
</tr>
<tr>
<td>National</td>
<td>27.9</td>
<td>9.1</td>
<td>29.3</td>
<td>19.2</td>
<td>28.6</td>
<td>14.2</td>
</tr>
</tbody>
</table>

Source: CDC (2005).

Note: Overweight: BMI >25 – 29.9 kg/m²; Obese: BMI >= 30 kg/m²

In the last four years, the prevalence of overweight and obesity has increased among both its youth and middle aged population. Obesity among young women 14–24 years old has increased by approximately 125 percent; in 2005, over 70 percent of women aged 45–54 years were found to be overweight or obese (Table 3-3). As Table 3-4 indicates, women were more likely to be overweight/obese than men in 2001 (67.4 and 54.3 percent, respectively) and more adults and youths were overweight and/or obese in urban areas (64.8 and 11.1 percent, respectively) than in rural areas (54.3 and 8.3 percent, respectively).

Table 3-3: Trends of Increasing Overweight and Obesity among Women (2001 and 2005)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Overweight</th>
<th>Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2001</td>
<td>2005</td>
</tr>
<tr>
<td>Middle Aged Adults</td>
<td>36.9</td>
<td>36.4</td>
</tr>
<tr>
<td>Youth</td>
<td>8.7</td>
<td>19.3</td>
</tr>
</tbody>
</table>


Table 3-4: Urban–Rural and Gender Comparison of Overweight and Obesity Middle Aged Adults and Youth (2001)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Total Overweight and Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
</tr>
<tr>
<td>Middle Aged Adults Women (50–60 yrs), Men (45–60 yrs)</td>
<td>52.2</td>
</tr>
<tr>
<td>Youth Women (14–20 yrs), Men (15–20 yrs)</td>
<td>7.7</td>
</tr>
</tbody>
</table>


Obesity is a complex disease caused by genetic and environmental factors. According to a 2003 study which identified causes of obesity among adolescents in IR Iran, the frequency of food intake, the consumption of high fat and salty snacks and carbohydrates (particularly bread, rice, and pasta) was significantly higher and the frequency of consumption of fruit and vegetables was significantly lower in
overweight and obese Iranian children than among children of normal weight. These findings are suggestive for a need to promote healthy dietary patterns, including the consumption of at least five servings of fruit and vegetables per day and the provision of healthy snacks from an early age (Kelishadi et al. 2003).

The government has undertaken several initiatives to curb the epidemic of overweight and obesity, yet many of the existing public health interventions are limited to either the provincial levels or the preparatory stages. In the district of Isfahan, the “Healthy Heart Project” is being implemented by the Isfahan Medical Science and Health Services University to encourage healthier lifestyles by providing more physical access for exercising and more knowledge on living healthier. With support from the district governor, new pathways for walking and exercise have been built, providing more parks and open space to encourage the population to engage in physical exercise, with public awareness promotion for healthier eating habits and lifestyles. The MOHME is also piloting the “Modifying and Improving Lifestyle” health center project in Tehran, where counseling and treatment is provided to those classified in the high risk groups for cardiovascular diseases.

The government hopes to restrict selling of products with trans fat in the commercial sector, but this has not yet taken place. Currently, there is no nationwide public awareness raising program to address overweight and obesity except for basic nutrition sessions provided to high school students. Large gaps continue to pervade in research relating to obesity prevention and management, as well as in behavioral research on the environmental, social, and familial influences on food intake and physical activity.

Starting in 2007, the MOHME plans to expand the Prevention and Control of Major Non-communicable Disease Program, initially piloted by Qazvin Medical University in collaboration with the World Health Organization. The main purpose of the project is to prevent and treat major risk factors of NCDs by community health promotion for healthy diets, physical activity, non-consumption of tobacco, and secondary prevention of chronic diseases in rural areas and in cities with a population over 20,000 inhabitants.

Additionally, the government has begun the process of preparing evidence-based NCD control guidelines by outsourcing to external experts. Most medical training is still disease oriented; using the curricula elaborated 21 years ago. However, a newly updated curriculum now takes into account a major focus on public health and on overall preventive approaches toward better health, and is being piloted to train medical doctors and health-related personnel in Shaheed Beheshti Medical University.

Promoting Mental Health

Psychiatric and behavioral diseases account for 16 percent of the total DALYs in IR Iran, ranking third among the 21 priority burdensome disease conditions, after accidents and ischemic heart disease. Among all mental diseases, depression accounts for 26 percent of the total burden and drug addiction for 24 percent.

The coverage of mental health programs at the health houses in rural areas has increased gradually, starting at 67 percent in 2000 and attaining over 90 percent in 2004. It is not clear regarding the type of assistance provided to those with signs of mental disorders, but the government reports that it is expanding its coverage. The coverage of mental health programs in urban areas is not known. However, there are only two psychologists and 0.6 social workers per 100,000 inhabitants nationwide. With the mental illness burden being substantial, the current 3 percent allocation of the total health budget for mental health may not be adequate.
As discussed in Section 2, suicide and traffic accidents account for two major causes of death among the Iranian youth. One possible response may be to create physical space and recreational facilities in which youth can enjoy sport or arts, and diverting attention from substance abuse and other risky behaviors.

**Diabetes Prevention**

The government initiated a national program for diabetes screening in rural areas that now extends to over 25 million people. In addition to questionnaires to assess the family history of diabetes and previous medical conditions, BMI and blood pressure are measured among adults over age 30. Among the eight million adults over age 30 that were screened in 2006, 35 percent had at least one risk factor for diabetes. If the individual is found with at least one risk factor, s/he is categorized as healthy, prediabetic, or diabetic. Those who are diagnosed as diabetic are sent to the health centers for counseling, care, and treatment. This active systematic screening approach is not yet implemented in the urban areas where the prevalence of diabetes is higher; and given the weakness of the PHC network in the urban areas (see Section 4), the government might need to consider alternative options to implement the systematic screening of diabetes, such as a strong partnership with the private health sector.

The lack of trained personnel and diabetes care facilities are also major limitations to expand diabetes screening and care approach on a nationwide scale. The general practitioners (GPs) are not trained in diabetes care in the medical universities, and the short-term training course requires two to three weeks. As of January 2007, out of the 21,500 GPs in the country, the MOHME had trained 2,000 in diabetes management. Though 200 diabetes clinics are functioning, 500 more clinics are required to cover the needs of the rural population, according to the MOHME. Health insurance covers the glucose reducing medication, but it does not cover counseling for diabetes care, syringes for insulin injections, or glucose monitors. Training of behvarzes is equally important; they have the ability to catalyze education of diabetes prevention and disease management in the community settings. A comprehensive approach to provide preventive and treatment care for diabetes on a larger scale could be considered.

**Re-Emergence of Infectious Diseases**

**Prevention of Substance Addiction and HIV/AIDS**

Nongovernmental organizations (NGO) and civil society play a major role in advocating the necessity for preventing harmful effects of drug use, such as the transmission of hepatitis C and HIV, to minimize the spread of HIV that results not only from sharing contaminated needles but also from other risky behaviors. These harm reduction programs are now implemented by both governmental and nongovernmental facilities. The NGO Persepolis initiated the “triangular clinics” in 1997 to provide integrated health care and service support to drug addicts and people living with HIV; they have now expanded to 67 cities and 52 prisons, and their aim is to:

- Reduce the levels of risky behavior among injecting drug users;
- Treat people suffering from the sexually transmitted diseases; and,
- Protect and support patients infected with HIV/AIDS.

These triangular clinics integrate services for treatment and prevention of sexually transmitted infections (STIs), injecting drug use, and HIV/AIDS (WHO 2004). The clinics offer harm reduction packages such as needles, methadone (a synthetic opiate used to treat heroin addiction as substitution therapy), condoms, treatment for sexually transmitted infections, antiretroviral therapy, and other medical services for people living with HIV/AIDS. In 2005, reports reveal that over 700 cases of IDUs were admitted to the drop in
centers per month (MOHME 2005). IR Iran is the only country in the Middle East that provides free needle exchange for drug users.

Since 2003, methadone maintenance treatment (MMT) was reinstated by the National Center for Addiction Studies as substitution therapy for opium/heroin abuse. Since the re-instatement, MMT has been piloted primarily in the Iranian prisons. Yet, with limited numbers of organizations providing MMT outside of the prisons, drug addicted prisoners find it very difficult to seek MMT once they are released. Due to the lack of limited service provision capacity overall, MMT appears ineffective to cease drug addictions among IDUs as well as to curb risk for HIV infection among those who share needles for drug injection.

A national intersectoral harm reduction committee has been established with representatives from the Ministry of Health, the Prison Department health authorities, judiciary authorities, academic centers, and NGOs. In 2005, an executive order was issued by the Head of the Judiciary on harm reduction, providing a legal framework that enables further advancement of HIV prevention (Ohiri et al. 2007). A strong collaboration across the health and judiciary branches of government, religious leaders, and civil society was found to be a key element in reaching the vulnerable population and in successfully implementing the harm reduction program. The triangular program is under the guise of the national medical universities, which collaborate on the financing and the provision of technical assistance.

Anti-retroviral therapy (ART) for HIV/AIDS is free of charge, and drugs for highly active anti-retroviral treatment (HAART) programs are provided by the Communicable Disease Control bureau of the Ministry of Health and Medical Education, which dispatches drugs to the medical Universities of Medical Sciences and Health Services. Approximately 50 percent of those estimated to be in need of combination ARTs due to advanced HIV infection were receiving the treatment in 2005. Although the most recent rate of mother-to-child transmission of HIV was 0.5 percent (MOHME 2006), only 2 percent of HIV-positive pregnant women were reported to have received anti-retroviral treatment for prevention of mother-to-child transmission in 2006 (Faroudi et al. 2006). A survey conducted by the MOHME found that 38.4 percent of all triangular clinic attendees in need of ART in 2005 received the actual treatment, while 21.6 percent of all injecting drug users in need of ART received it in the same period.

The sexual behavior and practices of drug users have not been thoroughly examined separately, nor is data available on the sexual behavior of IDUs. However, insight about sexual practices of IDUs can be derived from several surveys. An estimated 51 percent of IDUs started injecting before the age of 24 while 10 percent of IDUs started injecting after age 35. More than 60 percent of the IDUs mentioned either curiosity or pleasure seeking as the motivation or “drivers” for the first use of drugs, as well as peer suggestion as the main causes (Narenjiha et al. 2005).

According to the rapid situation, assessments of drug abuse in IR Iran showed that the average age of onset of sexual intercourse was 19, with over 64 percent of the respondents having their first sexual encounter before 20 years of age (Narenjiha et al. 2005; Razzaghi et al. 1999). Approximately 44 percent of married drug users had extramarital relationships. Over 70 percent of single respondents had sexual intercourse, most commonly with sex workers. Over 13 percent of the male drug users reported having sex with men while 23 percent had sexual contacts with sex workers.

The studies also revealed that 48 percent of drug users almost never used condoms, and only 16 percent used condoms frequently. Reasons given for not using condoms included:

- Not liking the use of the condoms;
- (Presumed) monogamy; and,
Lack of availability of condoms.

The packaging and instructions for condoms available in IR Iran are only available in English; they are not available in Farsi for export purposes.\(^{11}\) If condom use were to be promoted, having the packaging and instructions written in Farsi would be fundamental for user understanding.

Female injecting drug users comprise 2–4 percent of the total IDUs, with most in poor health and involved in sex-related occupations to earn a living (De Kort et al. 2006). In a survey of 196 women incarcerated for drug-related crimes and sex work, about 79 percent were commercial sex workers with an average sex work history of more than 11 months (Jahani et al. 2005).

Although HIV infection primarily concentrates among IDUs, including commercial sex workers, it appears that HIV infection has begun spreading to non-IDUs (e.g., sexual partners of IDUs and youth). There have been few research studies that directly examine high risk sexual behaviors among the general population. One such study done in Kermashah province found that a significant portion of men under the study had been infected by HIV through “temporary marriage,” a temporary solution for relieving sexual frustration legitimately under the law of Islam. Additionally, recent studies conducted among Tehranian youth found a lack of understanding on how to prevent HIV infection: their main sources of information were television, newspapers, and magazines. It was found that the role of schools in educating youth about HIV prevention was negligible. Without further education on HIV, STI prevention, and condom use, the custom of “temporary marriage” may trigger increased spread of HIV infection among the general population, and in particular among younger Iranians.

**Tuberculosis**

Tuberculosis (TB) is also re-emerging as a major concern due to the rise of HIV/AIDS-related infections and the development of strains resistant to standard antibiotics. It is said that most TB-infected people come in from Afghanistan, where IR Iran still faces an influx of over two million refugees, according to CDC of MOHME. An estimated 7 percent of the TB cases are multidrug resistant (i.e., medications are ineffective). An estimated 1.7 percent of TB cases also are HIV carriers, though there are thought to be large problems of under-reporting of TB.

**Environmental Health Issues and Programs**

**Air Pollution Control**

The Islamic Republic of Iran faces a wide range of environmental problems, among which the biggest is air pollution. This is especially true in the capital city of Tehran but also in other regional cities such as in Mashhad, Isfahan, Tabriz, and Ahwaz, all of which exceed the World Health Organization Safety Threshold by 40–340 percent (Table 3-5). In the capital of Tehran alone, approximately 1.5 million tons of pollutants are produced due to the aging transport sector, heavy industries (e.g., oil, cement, and chemical plants), and small- and medium-sized businesses: carbon monoxide from car exhaust makes up a large percentage of these pollutants. Most of Tehran’s 2 million cars are over 20 years old (most of these are domestically produced Paykans), with poor fuel efficiency and lacking catalytic converters and the ability to use lead free gasoline. Officials estimate that cars account for 75–85 percent of Tehran’s pollution. In addition to the transport sector, industries in the country emit annually more than 450,000 tons of sulfur dioxide and 100,000 tons of total suspended particulates.

\(^{11}\) This was verified by the doctor in charge of the regional area in this district during a visit to a health house in Zarnan in the Sha’hirar district in the outskirts of Tehran.
Islamic Republic of Iran, Health Sector Review, Volume II

Beside the motor vehicle emissions, another major factor of the deteriorating air conditions in Tehran and other Iranian cities is the rise in the country’s energy consumption. With an abundance of oil in IR Iran, petroleum products are heavily subsidized with artificially low prices. IR Iran’s energy-related carbon emissions have climbed steadily for the past two decades. Since 1980, carbon emissions have risen by 240 percent, from 33 million metric tons emitted in 1980 to 81 million metric tons in 2000. The widespread use of leaded gasoline and the circulation of cars lacking catalytic converters account for significant levels of carbon monoxide in urban areas. Tehran’s air pollution is made worse by the city’s geographic position: it is enclosed by the Alborz Mountains to the north, causing large volumes of pollutants to become trapped, and its high altitude (1,000–1,500 meters above sea level) makes fuel combustion inefficient and exacerbates the air pollution problem.

<table>
<thead>
<tr>
<th>Cities</th>
<th>Average PM 10 Monitored</th>
<th>Average TSP Monitored</th>
<th>Average PM10 Estimated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tehran</td>
<td>100</td>
<td>n/a</td>
<td>100</td>
</tr>
<tr>
<td>Mashad</td>
<td>n/a</td>
<td>n/a</td>
<td>85</td>
</tr>
<tr>
<td>Isfahan</td>
<td>102</td>
<td>n/a</td>
<td>102</td>
</tr>
<tr>
<td>Shiraz</td>
<td>n/a</td>
<td>152</td>
<td>76</td>
</tr>
<tr>
<td>Tabriz</td>
<td>69</td>
<td>n/a</td>
<td>69</td>
</tr>
<tr>
<td>Ahwaz</td>
<td>n/a</td>
<td>162</td>
<td>81</td>
</tr>
<tr>
<td>Karaj</td>
<td>n/a</td>
<td>n/a</td>
<td>100</td>
</tr>
<tr>
<td>Japan</td>
<td>n/a</td>
<td>n/a</td>
<td>33</td>
</tr>
<tr>
<td>Canada</td>
<td>n/a</td>
<td>n/a</td>
<td>21</td>
</tr>
<tr>
<td>Mexico</td>
<td>n/a</td>
<td>n/a</td>
<td>43</td>
</tr>
<tr>
<td>Turkey</td>
<td>n/a</td>
<td>n/a</td>
<td>56</td>
</tr>
<tr>
<td>Egypt</td>
<td>n/a</td>
<td>n/a</td>
<td>136</td>
</tr>
</tbody>
</table>

Source: Adapted from World Bank (2005) and Pandey et al. (2006c).

Note: Average Annual Values in µg/m3.

Particulate matter concentrations refer to the fine suspended particulates less than 10 microns in diameter (PM-10) that are capable of penetrating deep into the respiratory tract and causing significant health damage. The state of the country's technology and pollution controls is an important determinant of particulate matter concentrations. Schools are frequently closed and residents are asked to remain indoors due to the health risks of heavy air pollution. Respiratory ailments and allergies related to air pollution affect about 20 percent of the population, in particular children (World Bank 2003.) In Tehran, recent studies have shown that high levels of PM-10 could be responsible for an average of 52 cases of cancers and 62 deaths per 100,000 inhabitants every year (World Bank 2003).

A recent World Bank study (Table 3-6) of the cost of environmental degradation in IR Iran found similarly alarming results: it estimated that up to 13,200 persons die prematurely and that air pollution leads to 12,500 new cases of chronic bronchitis every year as well as 29,000 annual hospitalizations and 560,000 emergency room visits (World Bank 2005).
 Apart from correlation with chronic bronchitis, a retrospective time series study conducted in Tehran shows that level of air pollutant carbon monoxide and hospital admission due to angina pectoris are positively correlated (Hosseinpooor 2005). Air pollution control will help reduce the number of cardiac angina cases and death from ischemic heart disease, which is one of the major causes of death (see above).

The Government of the Islamic Republic of Iran has placed pollution reduction as one of its top priorities in its Third and Fourth Five-Year Plans. In 2001, a ten year program was launched to reduce air pollution by phasing out old motor vehicles and replacing them with newer, more fuel efficient ones. Tax incentives and fines to cut industrial pollution were put into effect to achieve compliance. In March 2002, diesel fueled vehicles were provided license plate numbers only if they had engines operating on compressed natural gas. At the same time, IR Iran’s Department of the Environment, the regulatory agency in charge of formulating environmental policies and regulations, and the Japanese International Cooperation Agency agreed to cooperate in reducing Tehran’s pollution levels, rehabilitate public transport, and phase out old automobiles.

Additionally, in 2003, the Iranian government signed a USD 20 million loan from the World Bank to reduce the impact of air and water pollution in major cities in five provinces. The project sought to help the Iranian government achieve progress on its air pollution reduction commitments in the development plan, and strengthen the Department of Environment’s ability to monitor air and water quality and support partnerships with other ministries, municipalities, universities, and NGOs by financing joint environmental projects (World Bank 2003).

The current Five-Year Plan urges development of intrasectoral action plans to reduce the air pollution level in Tehran, Ahvaz, Arak, Tabriz, Mashhad, Shiraz, Karaj, and Isfahan to the level approved by the High Council of Environmental Protection. The Department of Environment, the Management and Planning Office, Ministries of Petroleum, Industry and Mines, and Transport, and the Ministry of Health and Medical Education are responsible for preparing and implementing intrasectoral action plans.

The country still faces challenges in formulating strong environmental policies and regulations, and in enforcing these in practice. An intersectoral collaboration between the Department of Environment and other governmental bodies still has scope for improvement. In October and November of 2006, 3,600 people were reported to have died from pollution-related illnesses in four weeks (Tait 2007). In 2006, 9,900 deaths were reported in the capital from the effects of nitrous oxide and dust particles.
Action to address these issues would need to be twofold: (i) accelerate policy initiatives and plans to curb air pollution into action and (ii) ensure institutional and private sector compliance with policies including subsidizing the purchase of new unleaded cars, enforcing emission controls for old cars, providing more public transportation in-line with Tehran’s population, and increasing green spaces in cities.

**Promotion of Access to Clean Water and Sanitation**

The burden of disease and risk factor study shows that unsafe water and unsanitary toilets ranks number six in the attributable risk factors (Table 3-1 above). Safe water is currently accessible to 83 percent of the rural population, in comparison to 22 percent in the early 1980s. Official numbers indicate that 56 percent of rural households have a functional connection to water within the households (World Bank 2005a); however, almost all water supply schemes rely on local water sources, with nearly 90 percent coming from a borehole, spring, or qanat. A few multi-village systems have been established, either rural complexes serving up to 1,000 villages supplied from local sources and a shared treatment plan, or rural areas served from the nearest urban water supply scheme.

By contrast, modern sanitation in rural areas has been neglected, with coverage being only 0.5 percent (World Bank 2005a). Both in urban and rural areas, the sewage system remains problematic. In fact, throughout the country most of sewage is discharged untreated and, therefore, is a major source of pollution to both surface and groundwater. Industrial factories discharge heavy metals, which have the potential to affect the health of the population downstream. Subsequently, the quality of river water and groundwater has been deteriorating at alarming rates. Waste water from 890 cities and 68,100 villages and the irrigation of 7.5 million hectares present a significant risk to human health. For example, the heavily polluted water of the Karun River has had a detrimental impact on human health (e.g., child mortality and morbidity due to diarrheal disease). A rapid survey carried out under a World Bank-financed Environmental Management Support Project estimated the cost of damage to human health to be approximately USD 46 million annually.

Overall, the capacity of the Department of Environment to address the water quality issues is limited. It has neither the adequate enforcement capacity for environmental regulations nor authority for levying penalties.

**Mitigation of Occupational Health and Safety Hazards**

Industrial development, which began in earnest in the mid-1950s, has transformed parts of the country. IR Iran now produces a wide range of manufactured commodities, such as automobiles, electric appliances, telecommunications equipment, industrial machinery, paper, rubber products, steel, food products, wood and leather products, textiles, and pharmaceuticals. Apart from the agriculture sector, the manufacturing and construction sectors are two of the larger sectors that provide employment opportunities. Of the major industries, these two industries and the mining industry experienced higher rates of injury in the late 1980s relative to OECD countries (OECD 1989).

Available data from the MOHME show that enforcement of occupational health standards have lagged relative to goals. For example, the proportion of workplaces that comply with occupational health standards was merely 31.1 percent in 2004 (MOHME 2007). Only half of all workplaces receive periodic inspections for occupational health standards. The proportion of workers who benefit from occupational health examinations is less than one-third. This observation is reinforced by the burden of disease and

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12 Approximately 35 percent of employed workers were engaged in these two industries in 2004–2005 (Central Bank of Iran 2007).
risk factor study discussed above (Naghavi 2003). The study indicated that among the 28 risk factors, five risk factors are associated with occupational health standards or working environments and account for 8.5 percent of total DALYs attributable to risk factors (Table 3-7).

**Table 3-7: Occupational Risk Factors**

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Burden Attributable to Risk Factor (DALYs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ergonomic stressors</td>
<td>146,390</td>
</tr>
<tr>
<td>Occupational exposure to particles inducing chronic obstructive pulmonary disease</td>
<td>46,089</td>
</tr>
<tr>
<td>Occupational exposure to asthma-inducing material</td>
<td>5,733</td>
</tr>
<tr>
<td>Occupational exposure to material increasing risk of leukemia (benzene, ethylene, oxide) and ionizing radiation</td>
<td>640</td>
</tr>
<tr>
<td>Occupational exposure to material increasing risk of lung cancer (arsenic, asbestos, borelium, cadmium, etc.)</td>
<td>413</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>199,265</strong></td>
</tr>
</tbody>
</table>

*Source: Naghavi (2003).*

Among other occupational health issues, risk factors associated with working in hand-woven carpet firms is well documented. Small scale industry comprises 96 percent of industries and employs a large proportion of the workforce. Handicraft, in particular hand-woven carpets, is a major part of the small scale industry; it represents nearly 3 percent of the country’s gross domestic product (Choobineh 2004.) Approximately 2.2 million people are part or full time weavers and about 8.5 million people live directly or indirectly from the carpet making industry (Choobineh 2004.) Nearly 90 percent of workers in the industry are female, and the majority of them are exposed to the risk of developing musculoskeletal problems, skin disease, respiratory diseases, and impaired vision due to awkward postures (ergonomic stressors) and toxic chemicals used in carpet making. Under collaboration with the Ministry of Trade, the Environmental and Occupational Health Center of the MOHME launched a plan in 1995 to protect the health of carpet makers. From 1996 to 2004, nearly 325,000 factories and a half million workers were covered by this plan. Other types of documented occupational health issues are musculoskeletal symptoms among automobile assembly line workers, back pain among coal miners in Sharood District, and higher prevalence of respiratory symptoms among stone grinders.

The primary healthcare networks have used health houses to facilitate training classes for 1,477 workers under a collaboration of the employers, employees, and the Ministry of Labor. Similar to the mental health services, the scope of the occupational health services integrated into the PHC is unclear. Additionally, more than 1,760 behvarz stations have been put in place for smaller factories. Some measures have been taken to minimize the occupational health risks but based on the level of compliance shown above, an expansion of occupational health services would be needed. Larger manufacturing companies or heavy industries tend to concentrate in urban areas. In the absence of well-functioning PHC networks in the urban areas (see Section 4), the country faces substantial challenges in mobilizing resources to educate the employers, workers, and communities about potential occupational hazards and to enforce occupational health standards wherever risks are high.
Unfinished Public Health Agenda: Nutrition

Though IR Iran has had considerable success in reducing protein–energy malnutrition in the last decade, it still has been one of the highest under-five malnutrition rates in the Middle East and North Africa Region (World Bank 2000). The Anthropometric Nutritional Indicators Survey in 1998 showed that one out of every nine children less than five years of age was below the weight required for this age—attributed to malnutrition and metabolic problems—with a prevalence of underweight children in rural areas (13.7 percent) to be higher than that in the urban areas (9.6 percent). According to the Global Database on Child Growth and Malnutrition, the under-five malnutrition level in 1995 was 15.7 percent (WHO 2006d). In the periods 1995–2001 and 1996–2004, UNICEF estimates showed that the proportion of under-five children with moderate-to-severe malnutrition and moderate-to-severe stunting were 11 percent and 15 percent respectively. These malnutrition levels were higher than the regional average level of 14 percent for Middle East and North Africa Region, while the stunting levels were lower than the regional average of 22 percent (UNICEF 2003).

The Islamic Republic of Iran still faces an unfinished agenda of nationwide micronutrient deficiencies, especially of iron and zinc, and extremely low rates of exclusive breast-feeding practices, in addition to the high disparities of undernutrition in the southern provinces.

Iron Deficiency

Iron deficiency continues to be a major public health problem for Iranian women and children. Among the entire population, anemia is ranked as the tenth burden of disease and eighth among the burden of disease for women. An estimated 21 percent of pregnant women and 18 percent of children under the age of six are anemic from iron deficiency (MOHME 2006). Iron deficiency anemia is especially high among children in the 15–23 month age group at 38 percent. Anemia is also found among adolescent girls and boys aged 14–20 years at 17 percent (MOHME 2003). Compared to other 17 neighboring countries in the Middle East, IR Iran is ranked ninth worst in DALYs lost due to iron deficiency anemia (Table 3-8).

Multivitamin syrups that contain iron, vitamin A, and vitamin D are provided to infants from one week old to two years old. These syrups now cover 42 percent of all infants in the country. Pregnant women receive iron supplementation, currently at 85 percent coverage, and those seeking to become pregnant are recommended to take these at least three months before pregnancy. Iron supplementation, in addition to child vaccinations and growth monitoring, is only provided at health houses. Adolescent girls aged 14–18 receive weekly dosages of 15mg of iron for 16 weeks, once a year in school. This totals to 2 million girls among 70,000 high schools who are provided with iron supplementation annually during which nutritional education is provided.

Wheat flour fortification with iron is ongoing in 15 provinces where the World Bank’s Second Primary Health Care and Nutrition Project supported three provinces (Golestan, Sistan-Baluchistan, and Bushehr). The plan is to obtain universal flour fortification throughout the country by 2008.
Table 3-8: Ranking of Estimated DALYs Due to Iron Deficiency Anemia In the Middle East and Neighboring Countries

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Middle East and Selected Countries Neighboring IR Iran</th>
<th>Disability Adjusted Life Years (DALYs) caused by Iron Deficiency Anemia (per 100,000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Azerbaijan</td>
<td>424</td>
</tr>
<tr>
<td>2</td>
<td>Afghanistan</td>
<td>411</td>
</tr>
<tr>
<td>3</td>
<td>Iraq</td>
<td>355</td>
</tr>
<tr>
<td>4</td>
<td>Turkmenistan</td>
<td>352</td>
</tr>
<tr>
<td>5</td>
<td>Armenia</td>
<td>285</td>
</tr>
<tr>
<td>6</td>
<td>Syrian Arab Republic</td>
<td>260</td>
</tr>
<tr>
<td>7</td>
<td>Pakistan</td>
<td>237</td>
</tr>
<tr>
<td>8</td>
<td>Saudi Arabia</td>
<td>237</td>
</tr>
<tr>
<td>9</td>
<td>IRAN, Islamic Republic of</td>
<td>233</td>
</tr>
<tr>
<td>10</td>
<td>Lebanon</td>
<td>231</td>
</tr>
<tr>
<td>11</td>
<td>Jordan</td>
<td>227</td>
</tr>
<tr>
<td>12</td>
<td>Oman</td>
<td>225</td>
</tr>
<tr>
<td>13</td>
<td>United Arab Emirates</td>
<td>222</td>
</tr>
<tr>
<td>14</td>
<td>Qatar</td>
<td>213</td>
</tr>
<tr>
<td>15</td>
<td>Yemen</td>
<td>207</td>
</tr>
<tr>
<td>16</td>
<td>Kuwait</td>
<td>206</td>
</tr>
<tr>
<td>17</td>
<td>Egypt</td>
<td>186</td>
</tr>
<tr>
<td>18</td>
<td>Turkey</td>
<td>79</td>
</tr>
</tbody>
</table>


Zinc Deficiency

According to the National Micronutrient Survey of 2001, rates of zinc deficiency among pregnant women and children were high, where 39 percent of pregnant women, 28 percent of youth aged 14–20 years, and 31 percent of children aged six were deficient in zinc. Zinc is required to support the healthy functioning of the immune system as well as for healthy growth and development of the child during pregnancy, childhood, and adolescence. Children aged six and adolescents in urban areas have higher zinc deficiency rates than those in rural areas (Table 3-9). Understanding causation will require further analysis, followed by a course of action.

Table 3-9: Proportion with Serum Zinc Level below Normal (2001)

<table>
<thead>
<tr>
<th>15–23 Months</th>
<th>6 Years</th>
<th>14–20 Years</th>
<th>Pregnant Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>Rural</td>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>19</td>
<td>18</td>
<td>39</td>
<td>27</td>
</tr>
<tr>
<td>42</td>
<td>39</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: MOHME (2001c).

Inadequate Infant Feeding Practices

Almost all newborns are universally breast-fed in IR Iran; exclusive breast-feeding, nevertheless, decreases to 58 percent by the age of three months. This deprives the infant from receiving the vital nutrients, energy, and protein breast milk alone can provide (MOHME 2000a). Only 57 percent of infants
are exclusively breast-fed for four months. The global recommendation of exclusive breast-feeding for six months was only practiced by 30 percent of mothers in 2004, decreasing from 44 percent in 2000 according to the DHS survey. Studies show that exclusively breast-feeding children may prevent the development of chronic diseases and overweight later in adult life (Gillman et al. 2001; Hediger et al. 2001; Jones et al. 1998). Concerted effort would be needed to promote exclusive breast-feeding for the first six months of life and continuation of breast-feeding up to two years to promote the adequate physical and intellectual growth and development of children.

**Regional Variations in Malnutrition**

There are large disparities in the country in terms of health outcomes and malnutrition rates as indicated by the nutrition surveys conducted by MOHME. In rural Sistan-Baluchestan and the southern region of Khorasan provinces, high rates of acute malnutrition/wasting (15.5 percent) are found among children 15–23 months in comparison to the national average of 5.4 percent. Any level above 15 percent of wasting is considered “very high” in terms of public health concern according the World Health Organization’s classification of assessing severity of malnutrition. Levels of underweight are also high in that region at 40 percent in comparison to the national level of 8.6 percent. The stunting level is astonishingly high at 45 percent, which is threefold higher than national average (15 percent) (Table 3-10). High wasting levels (18 percent) are also found in children aged six years old in rural regions of Bushehr and Hormozgan and in the southern region of Khuzestan provinces, in comparison with the national average of 7 percent.

<table>
<thead>
<tr>
<th>Moderate–Severe (≤2 SD)</th>
<th>Sistan-Baluchestan, South Khorasan (%)</th>
<th>National Average (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>Urban: 25.3, Rural: 39.5, Boys: 32.6, Girls: 33.6</td>
<td>8.6</td>
</tr>
<tr>
<td>Stunting</td>
<td>Urban: 25.3, Rural: 44.9, Boys: 34.4, Girls: 37.8</td>
<td>14.8</td>
</tr>
<tr>
<td>Wasting</td>
<td>Urban: 15.8, Rural: 15.3, Boys: 14.0, Girls: 17.0</td>
<td>5.4</td>
</tr>
</tbody>
</table>

*Source: MOHME (2001).*

**“Core” Government Public Health Functions**

Public health functions are a set of fundamental activities that address the determinants of health, protect a population’s health, and treat disease. They prevent and manage major contributors to the burden of disease through effective technical, legislative, administrative, and behavior modifying interventions or deterrents, and thereby provide an approach for intersectoral action in health. Studies based on international practices show that essential public health functions of the government include (i) monitoring, evaluation, and analysis of health status, (ii) disease surveillance, (iii) health promotion, (iv) social participation in health, (v) health policy planning and management of the health sector, and (vi) regulation and promotion in public health (PAHO 2002). IR Iran’s primary health care (PHC) network successfully established important foundations for these public health functions, such as community-based health education and promotion and periodic surveillance.

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The government continues to provide food baskets to poor families with children in four of the most malnourished provinces: Khorasan, Sistan-Baluchistan, Kerman, and Hormozgan provinces. The dry rations are composed of grains, beans, sugar, and flour worth USD 10 per month. The total cost of food distribution is estimated to be worth USD 4 million.
With the emergent epidemiological profile, solutions will require reconfiguration of the government’s public health functions and a new set of public health interventions to reach the broader population and specific population in needs. Priority areas should include:

- Formulation and enforcement of public health laws and regulation;
- Intersectoral coordination;
- Strengthening of disease surveillance; and,
- Most importantly, strengthening health research.

**Development of Integrated Disease Surveillance**

Health information data is gathered from the Iranian population through the health facilities. Health houses in rural areas and the health posts in urban areas update their information on the population living within their catchment area by annual censuses, as well as from routine data which is gathered by:

1. Household folder, which contains each household’s health-related information, including the mother’s condition during previous pregnancies, health status of children, history of major diseases, patients requiring long-term care, births and deaths, and sanitary condition of the house, as well as literacy status of each household member;
2. Vital horoscope, which displays an up to the hour account of births, deaths, and family planning activities of the main and satellite villages; and
3. Monthly report forms which regularly relay data from all facilities in the district health network to the district health centers.

To plan for the expansion of the health network and the opening of new facilities, a Health Network Information Software (HNIS) was developed to gather and process data. It also records human and major nonhuman resources in each existing facility as well as the data from the vital horoscopes. The district health center is the most peripheral level of data entry. Floppy disks and e-mail are used to transfer data from district to provincial health centers and from there to the primary health care department of MOHME where facilities are available. Periodic surveys are also conducted to gather data on the coverage, household effects, and health programs outcomes (see Section 8).

Mortality in rural areas is recorded in the vital horoscope and reported to the national level each year. Although the causes of deaths are also recorded, these are not always perceived to be reliable or valid. In urban settings health facilities do not follow a policy of catchment area coverage so coverage is not complete, thus precluding gathering mortality data in a way similar to rural localities. In order to gather urban data and to improve the quality of rural registrations, mortality data are gathered, compared, and checked at district health centers. After omitting repeated cases, defective and nonreliable data are corrected through contacts with the reporting sources. The final district mortality lists are then sent to the provincial health centers where data are entered using specially designed death registration software, which compares entered cases and deletes duplicate records after verification.

This data mortality reporting initiative began in Bushehr province in 1999 and was expanded to three other provinces totaling a population of about 5.5 million. Its success helped spread the initiative to more provinces in succeeding years. By the end of 2004, mortality information by name, age, sex, place of residence, place of death, cause, and date of death was available in 22 out of 28 provinces, covering a population of more than 40 million.
A comprehensive surveillance system, including all the important or reportable diseases, does not exist in IR Iran except for special groups of diseases where well developed surveillance systems that provide reliable and valid data exist. Sources of data for measuring disease-related indicators include:

1) Notifiable diseases such as, malaria, poliomyelitis, measles, tuberculosis, diphtheria, HIV/AIDS, neonatal tetanus, cholera, major thalassemia, Avian Influenza, and meningococcemia. With the exception of HIV/AIDS and Avian Influenza, current information on diseases in this group is complete and acceptable.

2) Surveys: the incidence and prevalence of some childhood illnesses are measured through surveys for diarrheal diseases, acute respiratory infections, and nutritional disorders, in addition to the prevalence of major disabilities and diabetes in all age groups.

3) Data gathered during the primary implementation phase of some health programs namely, for diabetes, hypertension, brucellosis, kala-azar, severe mental disorders, and disabilities.

4) Medical records of hospitals and outpatient clinics: in university teaching hospitals, the international classification of disease codes is used for disease classification at acceptable qualities. The low quality of medical records in other centers decreases their usefulness as a source of data for calculating disease indicators.

Despite completing and reporting on a considerable number of monthly forms, peripheral personnel rarely use the gathered data for analysis and decision making. This, in turn, may not provide sufficient incentives to peripheral staff to gather quality and timely data. According to the “Review of Health Information Systems in the Islamic Republic of Iran” (WHO 2005c), the peripheral levels were not equipped with the tools and technical expertise needed for continuous assessment of health programs despite gathering large quantities of data. Though IR Iran’s data-gathering tools in the primary health care system are well designed and health personnel are sufficiently trained to use them, some weaknesses in the information system are apparent, such as the lack of appropriate indicators for certain components of health programs, especially non-communicable diseases; an absence of information-based decision making at the peripheral levels which may lead health staff to be indifferent to reporting quality data; and, lack of data analysis skills at the peripheral levels. Section 8 provides more depth on HMIS issues.

Regarding seasonal human influenza, IR Iran has a fairly developed and extensive surveillance system under the oversight and coordination of the Centers for Disease Control (CDC). The samples collected from the sentinel sites have so far been negative for H5 virus. However, given the fact that there is no active influenza-like-illness (ILI) surveillance, it is possible that staff in health posts, centers, and private doctors, as well as those CDC staff who work at the subnational level may not be in a position to detect a possible index case and investigate a possible outbreak using the standardized diagnostic criteria for possible, probable, and confirmed ILI for proper sample collection, clinical and epidemiologic investigation and case handling, as well as transportation and referral. There is, thus, a need to train CDC and other health personnel in the provinces on ILI definition, investigation of index case(s), broader epidemiologic investigation, and on sample collection, handling, and transportation.

The Islamic Republic of Iran has a well equipped BSL-II level national influenza center (NIC) reference laboratory based in Tehran. This laboratory routinely analyzes samples coming from either Tehran or from the provinces, 256 samples thus far, and has proven to be highly reliable in its diagnostic capacity. All samples sent to the World Health Organization reference lab in England for cross-checking and verification of the presence or absence of the H antigen (H1, H3, and H5) have so far been confirmed, and the NIC is now considered to become a reference lab itself for the region. In the current state, however, the lab can only handle up to 100 samples per week and respond within 48 hours and as such, may not be able to respond to a surge in demand in the case of an outbreak. The capacity of the sentinel laboratories
in the provinces will need to be built up and strengthened. There may be a need for a BSL-III laboratory in the event of an outbreak for virus isolation and culture.

**Formulation and Enforcement of Public Health Laws and Regulations**

Public health laws and regulations grant the state the “coercive” power to change the behavior of individuals and organizations. For example, in the case of smoking cessation, the international experience demonstrates that public health laws and enforcement can provide a variety of regulatory options to the government that can result in significant smoking reduction if multiple regulations are combined (Box 3-1).

Article 85 of the Fourth Five-Year Plan required the government to prepare and receive an approval from the Islamic Consultative Assembly and enact bills on the following priority areas:

- Reducing traffic accidents through reconnaissance of the accident generating points and axes along the roads and highways;
- Placing emphasis on the principle of safety and safe driving regulations;
- Regulating and completing the prehospital and hospital medical emergency networks throughout the country;
- Enhancing the safety plan for motor vehicles and enforcing human and safety engineering standards;
- Reducing hazards in the work place, pollutants in the air, water, soil, and agricultural and animal husbandry products;
- Defining the terms, extent, and manner of determining and collecting tolls and indemnifying penalties, and the manner of spending the proceeds.

It is not entirely clear if all of the suggested bills have been enacted; however, it does appear that a greater number of public health laws and regulations could be enforced. Law enforcement of some key public health laws could be adhered to more strictly to alleviate the extant risk factors. Not only road safety laws but also environmental regulations and occupational health standards would need to be enforced and closely monitored. International experience indicates that health sector reformers interested in making real changes need to think carefully about the enforcement process, available resources, legal capacity, political support, data and monitoring systems, and the incentives that laws and regulations will generate, before pursuing the regulatory route.

It is not clear if the MOHME has a designated unit that reviews existing public health laws and regulations and oversees enforcement. It would be critical to institute such a unit within the MOHME and would require intersectoral collaboration with nonhealth sectors.

**Strengthening Intersectoral Collaboration and the Stewardship Role of the Government**

As non-communicable diseases and accidents take up a greater part of the disease burden in IR Iran, the relative significance of societal determinants of health has increased. Intersectoral coordination can help reduce these risk factors, often associated with issues outside of the health system. There are several good examples of intersectoral coordination. For example:

- Drug Control Headquarters is a good example of intersectoral mechanism for conducting substance abuse and harm control. The coordination includes the Ministry of Health and Medical Education, the Ministry of Labor and Social Affairs, prison department health authorities, and NGOs.
• Under collaboration with the Ministry of Trade, the Environmental and Occupational Health Center of the MOHME launched a plan to protect the health of carpet makers in 1995. Nearly 325,000 factories and a half million workers have been covered by this initiative.

However, challenges remain with intersectoral coordination by MOHME in other areas, such as:

• Traffic accidents and air pollution with the Ministries of Transportation and of Environment respectively.

• Culturally appropriate physical education/school health programs with the Ministry of Education that could better educate schoolchildren and youth about the importance of healthy diets and physical exercise and other healthy behaviors.

International experience suggests that intersectoral coordination in health is a challenge for many countries. At the same time, the design of intersectoral actions can succeed if it includes attention to both the content of intersectoral actions (what will be done) and to the organization and financing of these actions (how it will be done).

**Health Research for Evidence-Based Public Health Interventions**

In the Islamic Republic of Iran, there are excellent research centers that produce high quality publications with highly qualified researchers. However, gaps in the knowledge of determinants of the various health outcomes and efficacy of different types of public health interventions still exist. Health research is essential to pursue appropriate evidence-based intervention strategies to improve the health outcomes of the Iranian population, specifically those who are underserved or marginalized.

Research results are not yet well linked with health systems improvements. For example, patient registry systems for chronic diseases remain weak, and there is a tendency to take a vertical and fragmented approach to disease management. It would be important for key institutions, such as the Institute of Public Health, to play a more active role in ensuring an effective coordination between medical research and health systems reform programs.

A recent study (Hosseinpoor et al. 2006) shows that despite the important role of the health system in reducing socioeconomic inequality in infant mortality (see Section 2), such inequality might also be related to factors beyond the scope of the health care delivery system. In addition to reducing inequalities in wealth and education, investments in water, sanitation, and housing infrastructures could influence the reduction of inequality of child mortality, particularly in rural areas. It could also support increases in the levels of health literacy, the development of an effective social security system, and the acceleration of economic growth with special attention to the poor. There is very limited knowledge on the situation of health inequality and its determinants. Given the limited understanding of health inequalities and their determinants, gathering data on the subject through research and investigation and analyzing periodic health surveys could help mainstream findings on disparities in health outcomes and utilization of health services by income.

**Conclusions and Recommendations**

The Islamic Republic of Iran has made great achievements in reducing overall motility and infectious and acute diseases in the country, and has set up a functional and effective primary health care system to achieve the goals of reducing mortality (discussed in Section 4). Nevertheless, attention needs to be paid to public health efforts to manage and prevent the onset of non-communicable diseases (NCD) and injuries and causal risk factors.
The predominance of non-communicable diseases (NCDs) and injuries in the disease profile of the Iranian population suggests a paradigm shift to manage and prevent the onset of these preventable diseases and risk factors. The Iranian government recognizes the importance of public health efforts to reduce the incidence of chronic diseases and disabilities, including a major shift of focus to tackling non-communicable diseases, as addressed in the Fourth Five-Year Plan.

Still, solutions will require reconfiguration of the government’s public health functions and a new set of public health interventions. The array of government efforts required to meet these challenges include integration of non-communicable diseases into a disease surveillance model, promoting behavioral research to gain an in-depth understanding of social determinants of health outcomes (e.g., mental health and substance abuse issues), and linking analysis with health policy formulation and implementation.

Additionally, IR Iran needs to strengthen intersectoral coordination to reverse the trends in health issues such as traffic accidents and air pollution. Raising public awareness of NCD prevention and providing the necessary infrastructure and information to the public will be vital. So too, the Ministry of Health and Medical Education would need to provide leadership to curb emerging disease burdens by enacting public health laws and policies.

In urban areas, the government’s PHC networks are less organized and functional than those in the rural areas. This difference poses challenges in effectively screening NCDs and providing adequate referrals.

Moreover, in the midst of a rapid increase of non-communicable diseases, high health outcome disparities still exist as noted in Section 2 and in this section. These disparities are particularly evident in southern IR Iran and intraregionally, in critical areas such as in infant mortality and malnutrition. The persistent rates of malnutrition, neonatal mortality, and emerging infectious diseases such as HIV/AIDS and tuberculosis also remain unresolved. A review of priorities in public health issues would be necessary in order to lay out a new strategy, plan and allocate adequate funds for the priority diseases, and develop a new set of public health interventions.

A comprehensive approach will be necessary, as will an approach that focuses on prevention of interrelated risks factors on non-communicable diseases, including hypertension, high body mass index (BMI), physical inactivity, poor diet, diabetes, high cholesterol, and tobacco use (WHO 2002; Hamet 2000). As many of the NCDs are interrelated, and as one disease leads to another, an overall changing of behavior toward healthier lifestyles by increasing physical exercise, and eating healthier, should be considered to provide an integrated solution to the multiple problems. At the same time, risk factors associated with habits or lifestyle, such as smoking, and sedentariness, requires interventions early in life. For example, most smokers begin before 20 years of age and tragically, continue smoking for the rest of their lives. Gaps exist in a number of areas as discussed in this section, including:

- Lack of appropriate surveillance system for non-communicable diseases, and an absence of data-driven decision making incentives at the provider levels to encourage health staff to be more conscious of timely data gathering and accurate data reporting;
- Research on how to address selected single issue areas and how to address multiple NCDs in a coordinated way. There are still large gaps in research relating to obesity prevention and management, as well as in behavioral research on the societal and familial influences on food intake and physical activity;
- No wide scale health education nor public health awareness programs that address the prevention of NCDs namely, cancer, cardiovascular diseases, diabetes, hypertension, and obesity, in an integrated manner at a national level. The medical doctors and health personnel are not trained in prevention and public health approaches needed to address NCDs;
• Enforcement is problematic in regard to road safety, and drivers are not following traffic rules nor are the police correcting the hazardous drivers’ behavior on the road to prevent further road accidents and injuries. Existing intersectoral collaboration is less than optimal;

• No programs to address the high levels of mental disorders in a comprehensive manner. Social determinants for the high levels of depression among women are not yet known and the magnitude of the problem strongly suggests further investigation;

• Harm reduction programs for drug addiction seem to be expanding successfully, but the demand side, namely, preventing the use of drugs does not appear to be addressed. Determinants of drug use or best practices in preventing drug addiction are not currently found, and further research of the sexual behavior and practices of drug users are warranted to prevent the spread of HIV and tuberculosis among injecting drug users;

• High suicide rates and accidents among the youth are alarming. Injuries, psychosomatic illness, and risky sexual behaviors can adversely affect the quality of life and productivity throughout the life cycle. The youth bulge currently observed in IR Iran presents a demographic opportunity: its economy can benefit from potential high productivity of the young. Failure to act on needed preventive interventions may manifest as a drain on economic development and growth later.

• The worsening air pollution needs to be addressed urgently. Though comprehensive plans have been elaborated, they now need to be put into action, and intersectoral collaboration needs to be ensured, including the private sectors’ compliance with air pollution reduction policies;

• There is some evidence of health outcome disparities between the different socioeconomic levels, and also between the different provinces, but there is very limited amount of knowledge on the situation of health outcome inequality and its determinants;

• High rates of anemia and undernutrition as well as neonatal mortality are still prevalent in the Iranian society, and need to be prioritized.

The economic costs of public health issues and the burden of disease are significant, as noted in Table 3-10 below. The table summarizes findings restricted to areas that could be monetized and where lost wages could be based on DALY estimates. Of course, these estimates are the “tip of the iceberg” and do not account for other costs such as: costs of absenteeism due to illness; labor productivity; labor supply as workers with chronic illnesses may need to retire early; and impact of the death of a household member on others’ behavior and welfare.

<table>
<thead>
<tr>
<th>Area</th>
<th>Economic Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental degradation</td>
<td>USD 348 million per year</td>
</tr>
<tr>
<td>Karun River pollution</td>
<td>USD 46 million per year</td>
</tr>
<tr>
<td>Traffic-related fatalities and injuries</td>
<td>1.8–4.0 % of GDP</td>
</tr>
<tr>
<td>DALYs lost attributable to risk factors</td>
<td>0.9 % of GDP in lost wages</td>
</tr>
<tr>
<td>DALYs lost to all diseases and injuries</td>
<td>5.6 % of GDP in lost wages</td>
</tr>
</tbody>
</table>


Note: Lost wages estimate based on 2003 numbers for GDP, wages of full and part time workers, and DALYs lost estimated in Naghavi (2003).

The following should be noted as priority activities and policy steps that can be envisaged both short-term (one to two years) and medium-term (three to five years) to address some of these challenges:
Short-Term Recommendations (One to Two Years)

1) **Develop a Three-Year National Strategy for Addressing Top Priority Diseases.** Prevention of NCDs, prevention of traffic accidents and injuries, reduction of substance abuse, and promotion of youth’s healthy lifestyles should be included as priority areas in the Strategy. The proposed Strategy specifies key roles of each stakeholder, delineates credible action plans for the coming three years, and provides clear monitoring and evaluation measurements. Intersectoral coordination as well as public–private partnerships and an essential stewardship function of the government need to be discussed as a cornerstone of the proposed Strategy.

2) In parallel with number 1 above, **Develop an Economic Impact Analysis of NCDs**, short- and long-term, and on other public health issues facing the country. Assess the impact on macroeconomic growth, job growth, and productivity. Assess and project the impact on GDP over time, both static and dynamic growth. Use the simulation to look at impacts of competing interventions, as well as a policy analysis to inform leaders and policy makers of the impacts of the current health, environmental, and occupational issues facing the country currently and in the near term.

3) **Focus on Nationwide NCD Prevention Advocacy.** Vigorous lifestyle change interventions are recommended for preventing non-communicable diseases, focusing toward weight loss, modification toward healthier diets, and increased physical activity. Top priority should be given to preventing overweight and obesity, which is now the number one leading risk factor for non-communicable diseases, in addition to promoting safe driving behaviors on a nationwide scale. Utilization of the media, celebrities and noteworthy community leaders to promote more physical exercise, healthy diets, and healthy lifestyles should be considered. Intersectoral collaboration of all institutions working on health, transport, communication, medical and basic education, with collaboration with the private sectors will be required. Healthy lifestyle messages and interventions in rural areas could be transmitted through the primary health care system and the community behvarzes, and written and visual media. Addressing messages toward younger children, especially youth, are priority agendas.

4) **Expand Screening and Care Facilities for NCDs to Urban and Rural Areas.** MOHME has already initiated screening and caring for individuals at risk of developing cardiovascular diseases and diabetes in rural areas, by screening for hypertension and diabetes-related risk factors. These initiatives should be expanded as much as possible also to both urban and rural areas. Accelerating the move from basic screening and passive intervention activities to a more progressive, outreach approach would offer an opportunity to scale up and to send messages of urgency to change lifestyles to the general population.

5) **Train New Doctors, Behvarzes and other Health Professionals on Preventive and Public Health Approaches with the Revised Medical Curricula** to address emerging burden of diseases. The newly revised medical curricula, which takes into account public health and overall preventive approaches toward better health, needs to be finalized and implemented on a nationwide scale as soon as possible. Training future medical and health-related personnel on preventive approaches, nutrition, mental health, and the overall social well-being of the population, rather than just disease-focused training, is now essential. It enables theses professionals to be key resource persons at all levels of intervention and to respond to the need of preventing the further emergence of disease burdens.

6) **Create Healthy Recreational Facilities for Youth and Outlets for Women.** Provide both male and female youth more physical space to be able to get involved in healthy activities that interest them, such as sports and arts to divert their attention away from substance abuse and risky behaviors and
from falling into mental disorders.14 To address depression and mental illness problems of women, providing peer support, professional opportunities, and outlets where women can discuss their life issues and focus their attention away from depressive behavior would be highly encouraged. These would be best addressed by accommodating to specific local needs by utilizing community networks and conducting regional/district needs analysis, rather than providing a nationwide, cookie cutter, single solution to address these sensitive issues.

7) Implement the Plan for Air Pollution Reduction. This is both an immediate- and medium-term action. The worsening air pollution situation needs to be addressed urgently. Though comprehensive plans have been elaborated by the government and funding provided, the plans now need to be put into action, and ensure institutional and private sector compliance with policies, including subsidizing purchase of new unleaded cars, enforcing emission controls from old cars, provide more public transportation facilities, and increase green spaces in the affected urban areas.

8) Provide Immediate Targeted Health Services Support in Underserved Areas. In areas where there are high rates of malnutrition, HIV, infant mortality and drug addiction, provide basic services as micronutrients, more health personnel, medication, and other unmet services as immediate measures to overcome health disparities.

Medium-Term Recommendations (Three to Five Years)

1) Better Enforce Existing Public Health Laws and Policies. Formulation and enforcement of public health laws and regulations is one of the key public health functions of the government. Reviewing the currently existing burden of diseases and risk factors, law enforcement of some key public health laws should be more strictly adhered to, to alleviate the risk factors existing in the country. Road safety laws, environmental regulations and occupational health standards should be enforced and closely monitored. Additionally, enforcement on tobacco tax or ban of smoking in public places need to be enacted and put into action to discourage the increase in smoking among the general public. The enforcement of banning sales of saturated and transfat should also be endorsed to hinder the aggravating health conditions caused by overweight and obesity.

2) Improve Disease Surveillance. The improvement of the information system for disease surveillance should begin with the strengthening of monitoring and evaluation of current health programs. Easy to measure indicators for non-communicable diseases need to be incorporated into the existing reporting tools, and the peripheral levels should be able to use the data gathered and reported to manage finances and request personnel, supply, or additional funding to initiate programs to address the needs indicated by the gathered information. This should take place in the process of decentralization of the health system as discussed in Box 2-3 “Decentralization in Iran” in Section 2.

3) Conduct Relevant Health Research and Strengthen Linkage with Policy Making and Decisions. There are still some gaps in knowledge of determinants of the various health outcomes and efficacy of different types of public health interventions in Iran. Health research is essential to pursue appropriate evidence-based intervention strategies to improve the health outcomes of the Iranian population, specifically those who are underserved or marginalized. Topics of importance and urgency are as follows:

   a) Social determinants of the extremely high levels of depression among Iranian women;

14 Of course, the continued high rates of (chronic) unemployment further contribute to leisure time. A perspective of social isolation, and create opportunities for depression and/or deviant behaviors. The creation of sound economic opportunities, general economic growth, and jobs training programs can also contribute though these areas fall outside the scope of this review.
b) Operational research to find successful behavioral change strategies to prevent drugs use among youth and male adults;

c) Operational research to find effective lifestyle change strategies to curb overweight/obesity, including the youth;

d) Sexual behavior and practices of drug users to prevent the spread of HIV/AIDS and tuberculosis among injecting drug users as well as non-IDUs, and the interrelation of sex workers and drug use in Iran; and,

e) Research on disparities in health outcome and utilization of health services by income differences. The study would provide better understanding of the bottlenecks in health services delivery to improve the equitable and efficient functioning of the health system.

In order to promote the evidence-based health policy making, it would be important to identify research needs based needs assessment of the health sector. Moreover, an enabling environment should be created through providing effective incentives for managers and policy makers to support evidence-based health policies. The MOHME plans to establish knowledge sharing centers in provincial universities and initiate health research centers on emerging important themes, such as health economics, mental health, trauma and other types of non-communicable diseases.

Research results are not yet well linked with health systems improvements. Key institutions, such as the Institute of Public Health, should play a more active role in ensuring an effective coordination between medical research and health systems reform programs. Deputy of Research in the MOHME has developed “Comprehensive National Health Research System,” which is being implemented from 2008 to 2010.
Section 4
Primary Health Care

Introduction and Overview

The presence of a strong primary health care (PHC) program enhances the performance of a health system in terms of improved health outcomes, user satisfaction, equity, efficiency, and effectiveness (Atun 2004). International experience demonstrates that PHC is an effective vehicle for improving health outcomes and narrowing equity gaps (WHO 1985; Lee 2003).

However, the true benefits of PHC are realized if key PHC functions are effectively discharged, and issues are addressed in a “holistic” manner: taking into account the context within which these problems exist. Although PHC is often equated with gatekeeping, it plays a much more fundamental role. The four main features of a good PHC program are:

- First contact access for each new need (first contact function);
- Long-term, person-focused care, which is ongoing care for the person and not just the short-term duration of a disease (continuity function);
- Comprehensive care for most health needs (a range of services appropriate to the common problems in the population: comprehensiveness function); and,
- Coordinated care, by which primary care acts to coordinate access to other services the patient needs (coordination function) (Starfield et al. 2005) and the health system.

Box 4-1: Summary Points

Iran has established an extensive network of PHC services with good coverage of rural populations, yet a lack of appropriate and adequate provision of health care persists in some remote areas. A good cadre of health professionals, including health assistants, supported by a large group of health volunteers provide a set of essential health services. Immunization coverage is excellent and family planning has effectively reduced birth rates to more acceptable levels.

In urban areas, PHC is failing. The government’s PHC networks are less organized and function less well than PHC networks in rural areas. This difference poses additional challenges for the government in effectively addressing the youth bulge, screening and managing non-communicable diseases and providing appropriate referrals.

An increasing number of people access private sector services, which are more expensive and not very well regulated.

The PHC services and resources need to be re-evaluated in the context of this changing pattern of disease burden. Addressing these challenges will require multifaceted and phased interventions.

It may be important to at least pilot these initiatives and options to learn and to then arrive at the optimal method for addressing human resources needs in the country.

A good primary health care system should be (i) accessible, especially for those who have the most need; (ii) inclusive, so that the needs and preferences of the community are taken into account, and (iii) provide services for which content and scope are informed by current evidence, resource availability, and emerging health needs.
The section is organized into six parts. The introduction provides a brief description of the analytical framework. An overview of how primary health care (PHC) evolved in IR Iran is next provided, to understand the context within which the PHC system developed and the values which drive this development. An examination of the PHC system follows, focusing on organization, financing, and approaches to service delivery. Third is an analysis of the strengths and weaknesses of the PHC system, in relation to the key functions of a well-functioning PHC system. Fourth, a brief examination of the changing context (in terms of demographic and epidemiological changes, technological advances, sociocultural trends, and evolving demand patterns) identifies the opportunities and difficulties facing the PHC system. When combined with the analysis of strengths and weaknesses, the section then identifies the challenges facing the Iranian PHC system. The fifth section analyzes evidence on the cost-effectiveness of PHC, and how an effectively functioning PHC system with appropriate incentives can improve efficiency, quality, health outcomes, and user satisfaction. This analysis is followed by the conclusion section that incorporates a series of recommendations to build on the strengths and address the weaknesses to meet evolving challenges.

Analytical Framework

With a well-functioning and equitable PHC system that provides effective (evidence-based) services, the majority of the health problems and encounters can be managed within the community setting. In European Union countries, for example, over 80 percent of medical encounters are managed in a community setting. A PHC system with effective first contact and gatekeeping functions should ensure accurate diagnosis and management of acute conditions commonly encountered in clinical practice – with very few referrals to secondary care level. By providing a comprehensive set of services and effective coordination, PHC should enhance continuity of care for common chronic conditions, thereby reducing referral and admission levels to secondary care and improving the quality of services provided for key chronic conditions (ambulatory care sensitive conditions).

Along with reduced referrals, an expected increase in utilization of PHC levels will also occur, especially for the key chronic conditions. Referral and admission levels will, to a great extent, depend on the presence of an effective referral and counter-referral system, incentive systems for providers, presence of evidence-based clinical guidelines, and dedicated services to manage these key conditions.

In addition to individual health services, an effective PHC level should also contribute to the public health function. This is particularly true in screening, surveillance, population health protection, health education, health promotion, and disease prevention activities.

At this level of service delivery, certain criteria are required in order to be effective: appropriate organizational structures that provide a degree of autonomy for health care providers (to enable them to respond to emerging needs and innovate); adequately refurbished and equipped units (that encourage demand and provide suitable infrastructure for resolution of problems); equitable resource allocation systems that reflect existing needs and inequalities; provider payment systems that reward performance and provide incentives to health workers for improving quality and efficiency; well-trained human resources; service specifications that are based on evidence; robust health information systems to capture necessary data in a timely manner; and quality assurance systems underpinned by monitoring and evaluation systems to inform decisions and provide feedback to health care providers on their performance.

The analysis of PHC system in IR Iran will explore the extent to which these key conditions are met, which functions are effectively discharged and working well, areas of weaknesses, and the gaps which will hinder provision of appropriate services to meet current and future demands.
Primary Health Care Services in the Islamic Republic of Iran

Evolution of Primary Health Care

The origins of the primary health care system in IR Iran can be traced back almost seventy years. In the period from 1937 to 1978 the majority of health care was provided by general medical practitioners. The First Five-Year Plan (1948–1954) aimed to expand hospital services by establishing new medical schools with teaching hospitals in addition to the University of Tehran. The Second Five-Year Plan (1955–1962) emphasized control and eradication of communicable diseases such as malaria and smallpox (Besarati et al. 1997). The focus of the Third Five-Year Plan (1962–1966) was to expand population coverage of health services by developing the national health service network and by increasing the number of trained health personnel. Although the coverage increased in this period, imbalanced investment led to high concentrations of health and human resources facilities in the capital Tehran while rural coverage remained poor. The expansion of population coverage continued with the Fourth Development Plan (1967–1972), which introduced a ‘Health Loan Fund’ to encourage physicians (through low interest rates and long repayment periods) to construct hospitals in provincial cities and rural areas. In this period, health services were transferred to local councils and PHC workers trained to further develop services in rural areas. These initiatives expanded coverage (by greater provision of health insurance, wider health care, and increased human resources), but this expansion, which ultimately led to a fragmented health system with poor integration, favored urban rather than rural areas.

As noted in Section 2, the Constitution adopted following the Islamic Revolution in 1979 identified the elimination of poverty as a key objective, with an emphasis on preventive care, investment in rural and underprivileged areas (with special attention to high risk groups), and general practice over specialized medical care (Shadpour et al. 2005).

“Reconstruction Jihad” began immediately after the Islamic Revolution and aimed at rapidly rebuilding and resourcing village health centers in rural areas (Willis et al. 1992). The endorsement in 1984 of the Alma Ata Declaration further catalyzed investment to develop an extensive PHC health care network, which is free at the point of delivery. This expansion was accompanied by the emigration of many physicians that was due to the Islamic Revolution and the Iran–Iraq War (1980–1988) (Ronaghy et al. 1985).

Organization of PHC Services and Access

The government-based delivery system, described in Sections 2 and 3, the main provider of health services, has strong PHC emphasis. There are over 2,300 urban health centers (UHCs), each covering a population of around 15,000 people. The UHCs are staffed by a minimum of three general practitioners and 15 health workers. In larger cities these are complimented by 600 urban health posts (UHPs) each of which cover a population of around 10,000 people living in poor areas and provide public health and preventive (but not curative) services. These UHPs are each staffed by five health workers. The health workers in UHPs are assisted by around 50,000 female volunteers, who support the provision of public and environmental health education, family planning, pediatric development, and immunization (Asadi-Lari et al. 2004).

As with the urban PHC structure, a two-tiered system exists in the rural areas. There are around 16,000 Rural health houses (RHH), the most peripheral health service provider within the PHC network and 2,300 rural health centers (ROCS). Each RHH covers a population of approximately 1,000–1,500 people in IR Iran’s 65,000 villages. The number of villages supported by a health house depends on the size of the population, geography, climate, and means of transportation and is determined according to detailed planning.
In general, the number of rural health houses, urban health posts, and urban and rural health centers have continued to increase (Figure 4-1), and now cover 95 percent of rural areas and the majority of the urban areas, which are also well provided by private sector providers. Nevertheless, the coverage in some areas such as Sistan and Baluchestan is still insufficient.

**Figure 4-1: Numbers of Rural Health Houses, Urban Health Posts, Urban and Rural Primary Health Centers (2000–2004)**

![Graph showing the increase in numbers of rural health houses, urban health posts, and rural and urban health centers from 2000 to 2004.]

*Source: SCI (2005).*

**Rural Primary Health Care Services**

The rural health houses are responsible for providing essential health care and public health services for individuals, households, communities, and schools. These services include: annual census and registration of core information on individuals and households; community health education and promotion; forming volunteer groups and local health councils; antenatal care; family planning; health care for children; immunization; nutritional care and education; care of schoolchildren and school hygiene; oral and dental health care; occupational health; environmental health; general health care services (including basic medical care and follow up, home visits, detection, diagnosis and treatment of illnesses according to national guidelines, injections, dressings, and common emergencies); rehabilitation services including assisting disabled individuals; and, education and training of health personnel and health service students (Malek Afzali 2006).

The rural health houses (RHH) are staffed by one or more auxiliary health workers, the behvarzes, as discussed in Section 2 and 3. The behvarzes provide treatment for minor illnesses and can prescribe from a range of around 40 medicines that can be dispensed from the RHH. They are also responsible for referring cases to the next level of service providers, the rural health centers. The behvarzes regularly collect information on the health of the local population and record this on the vital horoscope, which is a paper-based health data collection system developed in IR Iran covering key morbidity and mortality information of the population. They also undertake an annual census of rural areas: the results of which are used for planning purposes.

Rural health centers typically cover a population of around 7,500–9,000 people and are the only public providers managed by general practitioners (GPs). The GPs are typically young graduates who are fulfilling their two year compulsory rural service. He/she is provided accommodation immediately beside the health center and is available during the day and on call every night. The GP has a team of 10 health
workers comprised of family health technicians, a dental technician, a laboratory technician, environmental health workers, and an administrative staff. Key responsibilities of rural health centers include, inter alia:

- Monitoring the activities of the rural health houses;
- Monitoring and implementation of public health and MOHME health programs;
- Provision of ambulatory health care services and home visits;
- Basic laboratory tests for antenatal care and common illnesses;
- Management of referral and counter-referral to and from district general hospitals; and
- Dispatching mobile health teams to outlying villages; education, and training of local health personnel.

The Centers are also responsible for collection, control, and classification of data and statistics.

Around 15–20 percent of the rural health centers also have delivery units staffed by qualified midwives. These Centers provide antenatal and postnatal care for low risk pregnancies as well as other women’s services (such as cervical smears, family planning including intrauterine device insertion). The GP and the PHC team visit each rural health house at least once a week and supervise the work of the behvarz.

**Urban Primary Health Care Services**

The urban health posts provide the same range of services as the rural health houses but to urban populations. Here, women health volunteers assume the health education role undertaken by the behvarz in the rural health houses. As urban areas have alternative health care providers, there are modifications to the scope of services provided. Urban health posts have less involvement in treating patients (in treating symptoms, giving injections, or providing prescriptions) but provide more extensive women’s health and family planning services (for example, fitting of intrauterine devices or taking cervical smears); are responsible for inspecting environmental health in schools, public places, and factories and workplaces; provide health care services to workers in small factories and workshops; are charged with inspecting hygiene in places that handle food; and are involved in training of medical students. However, like rural health houses, many patients bypass urban health posts and directly access district hospitals, general practitioners, or specialists working in private clinics or private hospitals for their health care.

Urban health centers, the next level up, are established in cities and typically manage one or more urban health posts, but may also manage health houses in villages that are in close proximity to a city. Patients can attend urban health centers directly without a referral from an urban health post (unlike rural areas where referral from a health house is needed to attend an urban health post). The urban health centers provide all the services provided by urban health posts augmented by additional health services (especially when these are not provided by the private sector providers), that include laboratory tests (as in the rural health centers), management of higher risk antenatal cases, school visits and developmental checks of schoolchildren, oral and dental health care services, and epidemiological surveys. Urban health centers also have a broader role than urban health posts in data collection, analysis, classification, and reporting.
Those insured by the social insurance organizations are also able to access GP services in outpatient departments. The extent of cost sharing for this service varies by the organization (see Section 6 Financing and Purchasing).

In 2002, as Figure 4-2 indicates, the average number of consultations for GP services per year was estimated to be 8.4, but no trend data are available (MOHME 2002).

<table>
<thead>
<tr>
<th>Average Number of Visits Per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
</tr>
<tr>
<td>Private</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Source: MOHME (2002).</td>
</tr>
</tbody>
</table>

Expenditures for Primary Care Services

The same study showed that, on average, citizens spent Rls 26,510 (nominal figures) out-of-pocket for GP services. Of these, 20,280 were spent in the private sector and 6,680 in the government sector. In the latter, over 50 percent of the expenditure was for drugs, while in the private sector the main source of expenditure was direct payments to providers (Figure 4-3).

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15 For example, in the Social Security Organization (SSO), beneficiaries incur no cost if they use SSO facilities but share 30 percent of costs for outpatient care if non-SSO providers contracted by the SSO are used. If private providers that are not contracted by the SSO are used, then the difference between SSO tariff and the cost is payable. With the Medical Services Insurance Organization cost sharing is set at 30 percent for outpatient services, except for the rural populace who do not incur co-payment.
Overall, estimates vary for PHC expenditures since the definition varies among studies from primary health care to ‘ambulatory care’ and ‘curative care.’ According to the MOHME statistics, between 1991 and 2001, PHC expenditure as a proportion of total health expenditure ranged from 7 percent to 10 percent, but for the five-year period 1997–2001, this expenditure was stable at 8 percent (Figure 4-4).

A study by Kazemian (2005) on health spending in IR Iran between 1971 and 2001 estimates PHC expenditures as a percentage of the total public health expenditures to be between 25–30 percent, and as a percentage of the national health expenditures to be 8–12 percent (Figure 4-5). This probably reflects high expenditures for primary care in rural areas. This is low by EU or OECD standards; primary care expenditures in the UK, for example, are greater than 30 percent as a share of total health expenditures (public and private together).
Figure 4-5: PHC Expenditure as Percentage of Recurrent Public Health Expenditures And National Health Expenditures (1971–2001)

Source: Kazemian (2005).

Trends in Social Insurance Expenditures for Primary Care

Over the four year period 2000–2003, the latest years for which numbers are available, the proportion of expenditure for GP outpatient services declined as a proportion of total expenditure for the two major health insurance organizations, MSIO and SSO (Figure 4-6).

Figure 4-6: Expenditure on GP Outpatient Services by Social Insurance Programs (% Total)

Source: Kermani (2004).

In the same period, the health expenditure for specialist outpatient care (Figure 4-7) increased.
The number of physicians working in the MOHME system increased from around 11,000 in 1987 to 24,700 in 2005. The total number of doctors working in the health sector (including the private sector, the army health units, and networks managed by other ministries and State organizations) is estimated to exceed 60,000 (Malek Zadeh et al. 2001). There are a further 58,000 health volunteers who work at the PHC level to promote public health and family planning activities to a population of around 13 million persons. While the number of GPs has doubled from around 5,300 in 1987 to 10,700 in 2005, in the same period the number of specialists, including dentists, almost tripled from 3,970 to 10,500 (Figure 4-8).

Nurses, midwives, health workers, and behvarzes account for the bulk of the paramedical professionals employed by the MOHME (Figure 4-9).
Continuing Education for PHC Workers

An important distinguishing feature of the PHC services in IR Iran is the ongoing continuing education for PHC workers, which is used to cascade new knowledge and regulatory changes from the MOHME to different tiers within the PHC system. Workshops are held on a regular basis to communicate emerging policy objectives, new programs, and knowledge relevant to PHC issues. Each level educates the next level down. However, this training and development is not linked to licensing and revalidation activities and no system exists to assess the competences of health professionals once they have entered employment.

PHC and Data Collection and Tracking Systems

The IR Iran has a well developed data collection system at the rural primary care level. In the rural areas, personal, social, and health data are collected on each person in the community covered by health houses using a standardized data collection instrument, the vital horoscope, which is held as a spreadsheet at the rural health house. In addition to the vital horoscope, there is the ‘household folder’ containing information on the household and its members and follow-up logbooks used by the health personnel.

The vital horoscope comprises four concentric circles, each with 12 sections representing the months of the year. The data collected using the vital horoscope includes personal and social information, family history, and history of congenital and acquired illness. For example in the ‘section or slice’ for children, the innermost circle contains information on live births, followed consecutively by infant mortality, under-five child mortality, and mortality in those aged five years or more, followed by a square at the end of the concentric circles—a square representing the month.

The vital horoscope also allows tracking of children for development. For example, data is collected for each child born in the community on the date and time of birth, location of birth, nature of birth (e.g., normal or assisted, uncomplicated or complicated), weight of newborn baby, gender, maternal age, maternal health stats, conditions, and morbidity history. This information collected on each newborn baby allows the behvarzes to identify and individually track underweight children and institute intensive surveillance or when needed refer to general practitioners for assessment.
The household folder contains sociodemographic, health, and hygiene information on the household and its members, such as: age; gender; literacy levels; employment status; women and child health status; major illnesses; disability; births; deaths; and sanitary conditions (WHO 2005a).

The follow-up logbooks are used by health care workers for recording daily activities. Each logbook relates to a specific program or activity that is a priority for the PHC system (for example, family planning, developmental checks for children, immunization, and dispensed medications).

Individually, the gathered data are aggregated in a spreadsheet in every health house and used for monthly reporting. The aggregation of individual level data also enables the creation of community level data on age-stratified demographics, environmental health, incidence, and prevalence of vaccine-preventable disease, key public health interventions (e.g., quantity of iodized salt consumed), family planning, maternal mortality, level and causes of infant mortality and under-five mortality, and age- and sex-stratified mortality.

Data collected at rural health houses are monitored by dedicated health information supervisors the next level, namely the rural health centers, before these are sent each month to the district health centers to be pooled in a specially designed application software program that allows comparative analysis. The aggregated data on each community are sent to the deputy director of Public Health at the district health center. The health information officers at rural and district health centers provide feedback to the rural health houses on the quality, integrity, and the content of the data presented for each community (Asadi-Lari et al. 2004).

The regular collection and analysis of data at the rural PHC level has enabled the creation of an ‘observatory function’ to monitor the health of rural communities at the health house, health center, and district levels, as well as to monitor the functioning of major public health and PHC programs such as child health and malnutrition, immunization, maternal health, family planning, and iodized salt consumption to reduce endemic goiter.

In addition to collecting routine personal and public health data, the vital horoscope, household folder, logbooks and health information system also allow surveillance and reporting of communicable diseases, including the notifiable diseases as recommended by the World Health Organization. Any notifiable disease is communicated to appropriate authorities within 24 hours of diagnosis.

Routine data collection in rural areas is augmented by regular surveys such as the National Health Survey; the National Census which has a health module; surveys on general health status, women’s health (including family planning), and children’s health (including nutrition); disease-specific surveys such as that for mental health using DSM; and the national health accounts which identify resource flows, deficiencies, and inequities in financing.

**Effectiveness of Critical Primary Care Functions in the Islamic Republic of Iran**

Benchmarking the Iranian PHC system against key attributes of PHC—first contact, continuity, comprehensiveness, and coordination—reveals a number of strengths and weaknesses, which are discussed below.
First Contact Function

While the first contact function is particularly strong in rural areas that in urban areas is evidently weak. Consequently, while the referral and counter-referral system functions relatively well in rural areas, that in urban areas is fractured.

The poor gatekeeping function at the PHC level is evidenced by the trends of available utilization reported by the insurance organizations. As shown in Figure 4-10, the use of outpatient-based general practitioner (GP) consultations increased within the social insurance organizations in the four year period 2000–2003.

**Figure 4-10: Annual per Capita Utilization of Outpatient GP Services**

![Utilization of Outpatient GP Services](image)


As with the GP consultations, the number of outpatient consultations with specialists substantially increased in the same period (Figure 4-11).

**Figure 4-11: Annual per Capita Utilization of Outpatient Specialist Services**

![Utilization of Outpatient Specialist Services](image)

In the same period, as with outpatient consultations, the number of hospital admissions per capita also increased (Figure 4-12).

**Figure 4-12: Number of Annual per Capita Inpatient Admissions**

![Graph showing number of annual per capita inpatient admissions from 2000 to 2003 for different organizations.](image)

*Source: Kermani (2004).*

Of particular concern is the increasing number of per capita laboratory and imaging diagnostics investigations, which rose for all the insurance organizations in the period 2000–2004 (Figure 4-13).

**Figure 4-13: Number of Annual per Capita Laboratory and Imaging Diagnostics Investigations**

![Graph showing number of annual per capita laboratory and imaging diagnostics investigations from 2000 to 2003 for different organizations.](image)

*Source: Kermani (2004).*

**Continuity Function**

A lack of a named physician to coordinate a patient’s journey through the system and provide continuity of personalized care means that the continuity function is suboptimal. Presence of multiple subhealth systems, each with different provider networks and health plans further hamper efforts to achieve any meaningful continuity of care. This leads to substantial inefficiencies, duplication of investigations, and poor management of chronic conditions, which critically depend on good continuity of care.
Figure 4-14: Integrated Management of Non-communicable Diseases

Coordination Function: the Referral and Counter-Referral System

While the gatekeeping in rural PHC system works relatively well in rural areas — with a well established chain of referral from rural health houses to rural health centers and then to the next level — there is virtually no gatekeeping or referral system in urban areas. Primary care in urban areas is highly fragmented with multiple points of entry into the health system. For example, a person can enter the system through the urban health post or center, outpatient, or emergency department in the general hospital, private GP or narrow specialist working out of a small clinic, or a private GP/narrow specialist working in a hospital; but data are not available to ascertain the magnitude of referrals to the secondary care sector and utilization of the private sector providers. As with the poorly developed referral system, especially in urban areas, there is no functioning counter-referral system.

Comprehensiveness Function

The Islamic Republic of Iran has developed a balanced set of basic activities comprising health education, promotion, and curative services. While the core set of activities and services offered in PHC have been appropriate to address priority areas of the past (such as high maternal deaths and infant mortality due to infectious diseases), these are now less well aligned with the emerging needs that are shaped by the rapid epidemiological transition, which has led to substantial traffic accidents and increases in chronic illnesses (as discussed in Section 2 and 3). The changing epidemiology and demand patterns, in particular in urban areas, means that the services provided are no longer appropriate to the current and emerging needs.

Herein is the problem. While the PHC services in IR Iran were appropriate to the needs of the population in the late 1970s and 1980s, the changing burden of disease and shifting demand patterns mean that the existing PHC system is no longer suitable to meet current and emergent needs. This has serious implications for the PHC system in IR Iran, which has clearly succeeded in addressing high levels of communicable diseases, maternal deaths, and infant mortality; but appears less well prepared to address emerging challenges due to non-communicable diseases (NCDs). Some transition countries such as Estonia and the Kyrgyz Republic (Atun et al. 2005; Atun 2006a) as well as Latin American countries such as Chile (Atun 1996) and Mexico (Atun 1998) which have managed to reorient their systems to manage emerging disease burden due to NCDs. This issue is discussed in more detail below.
Health System Weaknesses
Which Adversely Affect the Primary Health Care System

In addition to the weaknesses identified in the key functions of the PHC level, a number of health system weaknesses exist with the current PHC model. These are outlined below:

Organization and Stewardship

Organizationally, the decision making in the health system is highly centralized. This leads to delays in decision making and undue emphasis on developing national ‘standard’ programs that allow limited regional variation in services to reflect the heterogeneity of demand patterns. In spite of government attempts to decentralize the health system, functional decentralization has not progressed in-line with geographic decentralization. In effect, there is more ‘deconcentration’ of decision making (with the MOHME retaining power) rather than a devolution or delegation of key functions.

The health system in IR Iran is characterized by a number of financing and health service delivery systems that function in parallel to each other. This leads to fragmentation of service delivery (especially in urban areas), poor intra- and inter-sectoral coordination, and weak linkages between and within health care institutions. In particular, there is inadequate coordination of planning between the public PHC system and the social security organizations. The absence of a named physician to coordinate patient care further compounds these problems. Consequently, the PHC system is unable to provide any meaningful informational and personal continuity of care, which is a precondition for effective management of chronic conditions.

While the rural areas are covered by public sector PHC providers, in large cities, private providers are in a dominant position. However, the systems for regulating the capacity and behavior of private providers are underdeveloped.

While there is a well established and functioning health information system at rural PHC system, data collection in the urban areas is more challenging: as many urban dwellers use private health providers for common ailments as well as complex interventions. In the urban areas family records at health posts and urban health centers are a vital source of routine data. These are augmented by data from the health volunteers and hospitals as well as routine epidemiological surveys undertaken by urban health centers. Nevertheless, there are no mechanisms to routinely capture and pool data from private sector providers or corporations that provide health services to their employees.

Presence of paper systems and separation of data collection, entry, and analysis means that, much of the data collected cannot be analyzed in a timely manner for planning, monitoring, and evaluation purposes. There is a unidirectional information flow between the levels in the health system. While the data are transmitted regularly to higher levels, feedback of analytic information from higher to lower levels often faces time delays and when information is fed back to lower levels, this is in the form of descriptive statistics of sums and averages: without detailed analysis that may help more effectively inform decision making.

However, the greatest weakness of the health information systems, and monitoring and evaluation systems is the paucity of data on the quality of the services provided and health outcomes. Data flows and information systems are addressed more fully in Section 8.
Payment Systems and Incentives

The current provider payment systems are suboptimal. They are based on salary with no incentives to improve performance, all the while efficiency, quality, or outcomes are not rewarded. In particular, there are few incentives to achieve a substantial secondary-to-primary shift. This hinders development of extended PHC with targeted programs for NCDs and move beyond a gatekeeping role.

Service Delivery

The health system responsiveness to emergencies is asymmetric to needs. For example, while the health system has been particularly responsive to managing natural disasters, such as the exemplary response during the Bam earthquake, it appears much less prepared to respond to the epidemiological emergencies of substance abuse, injecting drug use, HIV, and obesity.

At the PHC level, there are no widely shared evidence-based guidelines to manage long-term conditions — in spite of a large body of empirical evidence pointing to benefits to implementing such guidelines.

The health workers at the PHC level have not had adequate retooling and reskilling to meet the emerging epidemiological challenges. In particular, there is an emerging gap between the knowledge base of the behvarzes and that of the service users (especially the young), who are better informed about their health needs and problems. While chronic illness and complex sociomedical problems demand more sophisticated management approaches, the new generation of well-informed users have greater expectations for service quality.

Challenges Faced by the Current Primary Care System

The Health Transition and the Changing Demand Patterns

The emerging epidemiological profile in IR Iran, discussed at length in Sections 2 and 3, is consistent with that of a country going through demographic transition, with declining birth rate, infant mortality, maternal mortality, and vaccine preventable communicable illness. Simultaneously, IR Iran is also experiencing a rapid epidemiological transition, with an increase in the burden of non-communicable diseases.

Although broad population health outcomes in IR Iran have gradually improved over the past twenty years and are generally in-line with the levels achieved by the countries of the region, the ‘double burden’ produced by the overlap of the demographic and epidemiological transition presents a substantial public health challenge. As against a backdrop of declining but still considerable infant or maternal mortality, the major causes of death are now due to cardiovascular disease, accidents, and cancer, with a significant burden of DALYs from mental illness and substance abuse.

Another important feature of the health transition experienced by IR Iran is the evident epidemiological polarization: while the rural areas still have high levels of infant mortality and maternal deaths, the urban areas are experiencing an epidemic of cardiovascular illness. There is also an epidemiological polarization within different socioeconomic groups. For example, health outcomes and disease patterns differ widely in the poor provinces of Sistan, Baluchistan, and Kerman as compared to that of Tehran. While the former are still going through the demographic transition with relatively high infant mortality, maternal deaths, and tuberculosis, albeit with relatively high prevalence of substance abuse, in Tehran traffic accidents, mental health, and cardiovascular disease dominate the epidemiological landscape.
Evidence for the Effectiveness of Primary Health Care

The Islamic Republic of Iran can draw on international experience with and evidence on interventions that can be used to develop an effective and responsive PHC system designed to address the current and emerging needs, in particular the NCD burden faced. This evidence base is summarized below, followed by a number of specific recommendations that should be considered by IR Iran to strengthen its PHC system.

Global Trends in PHC Development

Globally, there is wide acceptance of the role of PHC in providing cost-effective health care (WHO 1985; Ham 1995) and improving health care access and outcomes while narrowing equity gaps (Lee 2003). Scaling-up PHC-centered integrated care in health systems is a key priority for the World Health Organization (WHO 2003), and key international agencies, such as the World Bank, supporting health system strengthening.

In the Alma Ata declaration, the World Health Organization defined PHC as ‘essential health care based on practical, scientifically sound and socially acceptable methods and technology, made universally available to individuals and families in the community through their full participation and at a cost that the community and the country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination’ (WHO 1978). Although, many developing countries have yet to attain what was envisaged in the Alma Ata declaration (WHO 1989), most countries have surpassed it. For example, in the United States and Europe, PHC has been variously defined in terms of concept, level, content of services, team membership, and process, reflecting the country context and emerging needs (Parker et al. 1976; Boerma et al. 1997a; Boerma et al. 1997b; Boerma et al. 1998). For this latter group of countries PHC is an integral, permanent, and pervasive part of the formal health care system (Basch 1990) and critical to integrating all aspects of health services for improving health and distributing resources equitably (Vuori 1984).

Effective Gatekeeping Function

Effective gatekeeping leads to a greater range of conditions to be managed by family practitioners (FPs) at the point of first contact (Boerma et al. 1997b; Forrest et al. 1999; Forrest et al. 2003). Gatekeeping modifies the patient care process with more first contact with an FP and consequently, less self-referral to secondary care services. In the United States, however, 75 percent of the variation in referral rates for specific conditions is attributable to the characteristics of presenting (Forrest and Reid 2001). Improved access to FPs and the gatekeeping function reduce hospital referral and leads to less hospitalization (Alpert et al. 1976; Moore 1979; Manning et al. 1984), less utilization of specialist and emergency centers (Hochheiser et al. 1971; Martin et al. 1989), and less chance of being subjected to inappropriate health interventions (Siu et al. 1988).

Shifting care across specialist–family practice and secondary–primary care boundaries is possible and has been shown to be cost-effective without adverse affect on health outcomes. For instance, family practitioner-led hospitals in Norway provide health care at lower cost compared with alternative modes of care (Aaraas et al. 1997). Several British studies confirm cost savings effect of FP hospitals by reducing referrals and admissions to higher cost general hospitals staffed by hospital specialist (Baker et al. 1986; Treasure and Davies, 1990; Hine et al. 1996). Care delivered by FPs as compared with hospital specialists in hospital-based accident and emergency departments is shown to be more cost-effective, with lower use of diagnostic investigations, lower referral rates to secondary services, lower prescription levels, and no significant difference in patient satisfaction or health outcomes (Dale et al. 1996; Murphy et al. 1996; Ward et al. 1996).
Effective Comprehensiveness and Coordination Functions

Typically, PHC addresses the most common health problems in the community (by providing preventive, curative, and rehabilitative services) to maximize health and well-being. Most importantly, PHC integrates care when more than one health problem exists and influences people’s responses to their health problems in a way that is relevant to a particular context. Primary health care plays an important role in organizing how resources at different tiers of the system are deployed to promote, maintain, and improve health (Starfield 1992). These attributes are particularly important when managing non-communicable diseases (NCDs), where an emphasis on ‘health maintenance’ through primary and secondary prevention and continuity of care is critical to improving outcomes.

Although family medicine is an integral part of primary care, the terms are not synonymous. The role of the family practitioner (FP) gives an indication to the breadth of the primary care services provided and the degree of uniformity in the services. In industrialized countries FPs provide a broad range of services and are the only clinicians who operate in the nine levels of care that include prevention, presymptomatic detection of disease, early diagnosis, diagnosis of established disease, management of disease, management of complications, terminal care, and counseling of the bereaved (Pereira-Gray 1978).

A substantial number of well-designed studies comparing care delivered by FPs to that by specialists show no significant difference in quality and health outcomes for the care delivered by FPs as compared with specialist when these services are substituted for secondary care specialist (Singh et al. 1984).

Family practitioners are more likely than narrow specialists working in hospital settings to provide continuity and comprehensiveness resulting in improved health outcomes (Shear et al. 1983). Evidence from a systematic review suggests that broadening access to FPs in PHC can reduce demand for expensive, specialist-led, hospital care (Roberts and Mays 1998). Additional training of family practitioners in patient-centered care on the lifestyle, psychological and physiological status of patients with newly diagnosed diabetes resulted in greater attention to the consultation process with improved communication with patients, and greater treatment satisfaction and well-being (Kinmoth et al. 1998).

Quality for care is influenced by structural and process aspects of practice organization. Availability of equipment and medical records has a positive relationship with improved quality. Efficient organization of practice, especially with data collection, as well as prescription and referrals improves performance (Ram et al. 1998). In particular, effective use of computerized information systems (Mitchell and Sullivan 1995) and computerized decision support systems can improve physician performance and service quality (Hunt et al. 1998; Mitchell and Sullivan 2001).

Box 4-2: Multifaceted Reduction for Non-communicable Diseases (CARMEN) in Chile

The increasing risk of non-communicable diseases (NCDs) in Chile led to a National Plan for Health Promotion in 1997. Among its priority areas were the promotion of a healthy diet and the lowering of the prevalence of obesity in the general population, in particular among schoolchildren and pregnant women. Further, in 1996 Chile joined the CARMEN initiative ( Conjunto de Acciones para la Reducción Multifactorial de Enfermedades No Transmisibles, or Set of Actions for the Multifactorial Reduction of Non-communicable Diseases) of the Pan American Health Organization. The CARMEN initiative was modeled after the Canadian/European experience of the Countrywide Integrated Non-communicable Disease Intervention.

Under CARMEN, it was considered vital that not only nutritionists but all the other health personnel on PHC teams assume an active role in contacts with patients and the public so as to encourage lifestyle changes, especially ones related to diet. This approach was proven to be effective by the Canadian Heart Health Initiative, and it provided the public and patients with better information and advice. Despite
initial high expectations, the CARMEN initiative produced little success in Chile and was not institutionalized. Problems encountered in implementing CARMEN included lack of experience in intersectoral collaboration and coalition building, lack of economic incentives for physicians to contribute preventive health services, and resistance to the concept of integrated action.

With the absence of effective preventive measures, the prevalence of NCDs continued to increase. The 2003 National Survey showed a high prevalence of risk factors among the general population: sedentary lifestyle (90.8 percent), cigarette smoking (42.0 percent), low HDL cholesterol concentrations (39.3 percent), hypercholesterolemia (35.4 percent), hypertension (33.7 percent), and obesity (23.2 percent.) Forty-one percent of the population had two or more major risk factors and 55 percent had a global cardiovascular risk classified as “high” or “very high.”

Since 2000, the Government of Chile has been implementing a program whereby acute myocardial infarction and other NCDs are seen as part of 56 health conditions to be covered by the “Explicit Health Guarantee System” legislation. This established that anyone presenting with an acute coronary syndrome will have appropriate medical assessment and treatment, including secondary prevention medication at discharge. As to primary prevention, type 2 diabetes and essential hypertension have been included in the new bill; smoking, obesity, and sedentary lifestyle have not been included to date. It is hoped that further emphasis will be placed on primary prevention, including better control of risk factors and psychosocial and environmental determinants in the Chilean society.

*Source*: Keller et al. (2004) and Bambs et al. (2007).

**Effective Continuity Function**

There is a strong and consistent association between continuity and increased patient and doctor satisfaction. A patient's enablement and satisfaction with a consultation is strongly associated with visiting the same doctor (Howie et al. 1999; Hjortdahl and Laerum 1992; Baker 1996). When doctors know patients well, compliance and the accuracy of diagnosis are increased (Freeman and Richards 1994; Ettlinger and Freeman 1981; Nazareth and King 1993). In particular, patient–physician partnerships, established through collaborative goal setting and agreed action plans, improve patient care and outcomes for asthma, diabetes, arthritis, and other key chronic conditions (Bodenheimer et al. 2002).

Patient satisfaction with family practitioners is strongly influenced by the mode of care delivery, physician style, a named physician availability of after hours care, and continuity of care (Calnan et al. 1994; Williams et al. 1995; Baker 1996; Wensing et al. 1998). Patient satisfaction is higher in smaller practices and those which have personal lists with a named doctor responsible for the enrolled patients (Baker and Streatfield 1995). The Euro barometer survey of citizens from 15 EU countries shows that Denmark, which has a strong primary care system with access seven days a week and 24 hours a day to FP-led primary care, has the highest public satisfaction with health care (Mossialos 1997). The value placed on the accessibility of services delivered by family practitioners is an important factor that influences public satisfaction with family practitioners (Davis 2002).

**Box 4-3: Primary Health Care Reform in Estonia – Integration of NCD Management**

In 1992, Estonia transitioned from the Soviet-based Semashko model to a family medicine-centered primary health care (PHC) system. It was accompanied by a legislative package of other reforms that established insurance, a purchaser–provider split, and organizational and delivery reforms.

In 1993, family medicine was designated as a specialty in Estonia, the first post Soviet country to do so. A three year residency program for new graduates and in-service training for specialist working in PHC were introduced. Existing subspecialties of “general therapists,” pediatrics, and obstetricians were retrained to allow them to provide a broader package of services.
In 1997, new health service regulations required all Estonian citizens to register with a family practitioner (FP), who in turn contracted with the Estonian Health Insurance Fund (EHIF). The FP provides PHC services to their registered population. Funding for PHC comes predominantly from the EHIF. Ministerial regulations defined responsibilities of FPs, the practice of the specialty and introduced a new per capita payment system mixed with fee for service and allowances, including a special payment for doctors trained and certified as FM specialists. These changes also allowed FPs to become private practitioners contracted with the EHIF. As a result, specialist training of FPs and the EHIF contract significantly broadened the scope of services delivered in PHC settings. Evidence-based guidelines for management of acute and chronic conditions, introduced in the late 1990s, were introduced into PHC and encouraged FPs to manage these conditions and to reduce referrals to narrow specialists.

Later, in the early part of this decade, EHIF moved to selective contracting of FPs to encourage competition. It then moved to a broader package of fund holding, which placed outpatient specialist services within the capitation package. These two measures further encouraged greater efficiencies in performance. The FP experience has demonstrated improved management of key chronic conditions by FPs in PHC settings and reduced hospital admissions for these conditions.

Estonia is a good case study of a multifaceted and coordinated approach to reform: legislative changes, organizational restructuring, changes to financing and provider payment systems, new protocols, creation of incentives to enhance service innovations, and investment in human resources development. This multifaceted approach was critical to success of the overall reforms.

Source: Atun et al. (2006); Langenbrunner et al. (2005).

Effect of Incentives Created through Provider Payment Systems

Although the behavior of family practitioners (FPs) is influenced not just by economic considerations but also by status seeking, intrinsic motivation and altruism (Scott 2001), economic incentives play an important part in influencing behavior. Indeed, there is strong evidence from the UK that linking FPs remuneration to achieving quality targets leads to improved quality of services and health outcomes, particularly, as demonstrated in the UK context, for chronic illnesses (Leese and Bosanquet 1995; Campbell et al. 2005).

Economic incentives created by different provider payment systems impact on the scope and quality of services provided (Shimmura 1988). When FPs are paid by fixed budgets and have to bear the full monetary and nonmonetary cost and risk of providing services to patients, then the FPs provide an efficient mix of services to patients, but the service quality level falls to a minimum (unless the FP is
driven by nonpecuniary incentives) (Zweifel and Breyer 1997). This is not surprising as the FPs have no incentive to provide additional or high quality services beyond the minimum required. Similarly, if FPs are paid by salary with no financial incentive to improve quality, nonaltruistic FPs have an incentive to minimize effort and refer excessively to hospitals to reduce their own workload.

The FPs paid by capitation receive a fixed payment for each patient on their list and bear the full monetary and effort cost of providing care for their patients. They have an incentive to employ inputs efficiently but also to provide high quality services to register new patients (Gravelle 1999). A national study of the referral practices of US physicians found that paying physicians by capitation did not influence referral rates, although it was associated with more referrals made for discretionary indications (Stoddard et al. 1998).

Fee for service (FFS), especially selective FFS can help improve access, utilization, and even quality of services, especially for those where the quality of services are low (Rocheix 1998). However, there is a risk of overprovision of these services as physicians have an incentive to provide excessive service to get paid (McGuire 2000). The presence of competitors and a FFS payment system induces competition to improve quality but may too result in overprovision of services (Dranove and Satterthwaite 2000).

Empirical evidence from Nordic countries suggest that changing payment methods from pure capitation to a mixed payment including FFS elements leads to an increase in the intensity of diagnostic and curative services provided by FPs, but a reduction in the number of referrals and prescriptions (Krasnik et al. 1990; Krasnik et al. 1991).

Payment methods for physicians and hospitals are again taken up in Section 6.

Conclusions and Recommendations

The Islamic Republic of Iran has established an extensive network of PHC services with good coverage of rural populations, yet a lack of appropriate and adequate provision of health care exists in some remote areas. Hence, substantial inequities persist in access to first line services and health outcomes. While not discussed here, a well-developed hospital network exists (as outlined separately in Section 5). The various social insurance schemes provide coverage for about 90 percent of the population (as outlined in Section 6). There is a good cadre of health professionals, including health assistants, supported by a large group of health volunteers that provide a set of essential health services. Consequently, in recent years IR Iran has enjoyed an improvement in population health indicators: while the maternal mortality, infant mortality, and under-five mortality have declined, and life expectancy has improved. Immunization coverage is excellent and family planning has effectively reduced birth rates to more acceptable levels.

In spite of these achievements, many challenges remain to be addressed if the Iranian health system is to build on its strengths to meet the changing health needs brought about by the rapid epidemiological transition. The PHC services and resources need to be re-evaluated in the context of this changing pattern of demographics, the changing disease burden, and the increasingly urban migration of its citizenry. The urban primary care model remains underdeveloped and appears to have little impact in managing care at cost-effective levels of service. Addressing these challenges requires multifaceted and phased interventions aimed at health system strengthening and developing extended primary care. Some of these interventions are summarized below.

The section did not cover everything. For example, very little data was available on psychiatric care in the PHC context. This is disappointing, not only because psychiatric illness features prominently in the
burden of disease, but also because of IR Iran’s good practice experience integrating basic psychiatric care into the work of health assistants.

Short-Term Recommendations (One to Two Years)

1) *Enhance the Stewardship Function of the MOHME.* The stewardship function of the MOHME should be strengthened to better coordinate the health system, especially the social security organizations and the private sector. The MOHME should use its stewardship function in an effective manner to create public–private partnerships to reduce duplication in PHC provider capacity and inefficiencies in service delivery, which adversely impact on the first contact, continuity, and coordination functions of PHC. It should establish minimum quality standards. This will require investment in training of the MOHME staff in management.

2) *Strengthen Mechanisms for Accreditation of Health Care Providers.* A quality enhancement agency should be established for accreditation and register established listings of all public and private institutions that are accredited to provide health services to the population. To ensure common quality standards, all PHC service providers (private and public) wishing to provide PHC services or enter into contracting arrangements with the purchasing agencies should be accredited and reviewed on an ongoing basis. The accreditation process should define common standards and quality criteria in terms of:
   
   a) Appropriate quality standards for the services delivered;
   b) Appropriateness of building and infrastructure;
   c) Appropriate equipment;
   d) High quality of record keeping and patient records;
   e) Evidence of teamwork;
   f) Presence of systems to safeguard patient confidentiality;
   g) Evidence of continuing professional development for team members; and
   h) User involvement in decision making.

3) *Strengthen Referral and Counter-Referral Systems.* Structural weaknesses in the organization of service delivery need to be addressed by developing a more effective interface between the subsystems of the health sector to enhance integration and continuum of care. There is a need to develop transparent referral criteria that can later be incorporated into clinical care guidelines to encourage management of health problems at PHC level and reduce unnecessary referrals to hospitals. This is critical to effective functioning of PHC to realize efficiency gains and to improve quality. The gatekeeping function of PHC must be strengthened by limiting access to secondary care only after referral by a named family physicians or general practitioner.

There is good experience from countries that have well developed PHC systems (such as England and the Netherlands) where a strong gatekeeping function has been established. This will also help enhance continuity of care and improve the ability of PHC level to optimally coordinate the patient’s journey through the health system.

4) *Expand the Scope of Services Provided in PHC.* PHC in IR Iran is characterized by poor continuity of care and consequent fragmentation of the care process. There is excessive reliance on narrow specialists and hospitals to manage chronic illness, and a need to build on the existing strengths of the PHC system by developing the scope of services offered.
The existing set of PHC services provided by general practitioners and when available, trained family physicians should be expanded to enable the provision of a wider scope of care than that which is currently available. This ‘core’ set of services should emphasize continuity of care for common conditions, including relevant health education and promotion advice, disease prevention (primary and secondary), and referral as appropriate. The core services package should have well defined quality indicators to measure the effectiveness and efficiency of service delivery. It should also include regular clinical audit as a key activity to assist quality monitoring and improvement at provider level. Clinical audit should be undertaken by all PHC providers to demonstrate achievement of key quality standards.

In progressive provinces or regions that have pilot programs on managing hypertension, diabetes, and asthma and in areas with greater population density, an ‘additional service’ package should be introduced to further expand the scope of services provided in PHC (for instance, managing chronic illnesses like asthma, chronic pulmonary disease, diabetes mellitus, epilepsy, heart failure, ischemic heart disease, and mental illness) according to evidence-based guidelines—to encourage gradual substitution of PHC services currently provided in outpatient settings in hospitals, and to reduce the number of referrals to hospitals for consultation, investigation, and admission.

Development of PHC through introduction of an ‘additional’ service package that focuses on effective management of chronic illnesses is critical to IR Iran as most NCDs and injuries can largely be prevented by integrated approaches that address main risk factors—especially when population-based public health strategies are combined with health care interventions that target ‘high risk’ individuals. But, to take on this expanded role the knowledge base, skills and competences of behvarzes, health technicians, and general practitioners need to be augmented through additional training. Development of PHC can be catalyzed if the social security organizations strengthen their strategic purchasing function to develop selective contracting of these services (see Section 6 on Purchasing).

5) **Develop and Implement Evidence-Based Clinical Guidelines.** There is a need to improve the evidence base of services provided through development and implementation of evidence-based care guidelines especially to manage common chronic illnesses. There is good evidence from developed (and developing) countries that such guidelines encourage optimal use of resources, improve service quality, reduce variability in service quality, improve linkages between and within levels of the health system, and reduce duplication along the care continuum.

However, effective implementation of evidence-based guidelines will require appropriate incentive systems to reward those providers that effectively implement these guidelines, improve health outcomes, and achieve higher user satisfaction. Such changes must be underpinned by substantial investment in health information systems and develop monitoring and evaluation systems that can capture activities and outcomes to assess the quality of services provided by different providers (see Section 6 on incentives and Section 8 on HMIS).

Successful development and implementation of guidelines will depend on close engagement of professional groups and provider organizations. As a first step, a Center for Evidence-Based Medicine should be developed and appropriately staffed along with a Guidelines Task Group to develop guidelines in a systematic manner. This Group should comprise user groups (such as physicians, nurses, and allied health personnel), planners (MOHME), payers (SSO), patient groups, and professional associations.

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The Guidelines Task Group should identify priority areas and develop these in two stages: (i) assessment and (ii) appraisal. The assessment phase should examine the existing evidence for best developed practice (from international guidelines which exist), and the appraisal phase should focus on developing a consensus on what is appropriate for Iran.

6) **Align Benefits Offered by the Social Insurance Organizations, such as the SSO and the MSIO.** Benefits offered by the social insurance organizations should be developed to encourage continuity of care through portability of the benefits, and to inject greater emphasis and contestability into the PHC level. This could be done through an open enrollment and sign up program for PHC and FM physicians. This alignment should be coupled with the development of a core set of services for PHC for urban and rural areas.

Alignment of benefits and creation of a core set of PHC services will enable the social insurance organizations to contract with a plurality of providers and the beneficiaries to choose different PHC providers on a periodic basis. The core service package can be used as the basis for developing a per capita payment system for providers.

**Medium-Term Recommendations (Three to Five Years)**

1) **Develop Regulatory Environment and Capacity to Implement Direct Contracting with PHC Providers.** Enhancing autonomy of PHC providers with effective use of contracting can stimulate improvements in service quality and productivity. This needs strengthening of existing regulations to define the status of service providers as independent legal entities (e.g., public, private, not-for-profit, and non-governmental organizations) with appropriate managerial and financial autonomy to directly contract with purchasers to enable them to respond to incentives. In relation to contracts with purchasing agencies (social security organizations and the MOHME), regulations need to be strengthened to better define the composition of PHC providers, team members (e.g., GPs, FM specialists, nurses, and behvarzes), their competences, roles and responsibilities.

2) **Establish Family Medicine Specialty.** There is a need to develop family medicine specialty. This will require investment to design a specialist training program in family medicine.

3) **Create Family Medicine Centers.** The PHC system based on behvarzes and GPs should be strengthened by introduction of FM specialists and nurses to augment the services provided. FM Teams or FM Group Practices (typically comprising family physicians, nurses or behvarz) should be created as independent entities able to contract with the MOHME and the social security organizations. Patients within a geographic area should be able to enroll with an FM team or a Group Practice of their choice, as outlined in recommendation number 6 above.

The geographic boundaries for the FM teams and FM Group Practices should be designated according to need in order to ensure equitable distribution of teams and to promote patient choice and access. The FM teams should have overlapping geographic boundaries within a designated area—defined so that the boundaries are coterminous with municipality or other administrative boundaries to facilitate multisectoral working. Rural areas with low population density may have correspondingly larger geographic territories designated as practice areas than urban areas which should be smaller.

4) **Strengthen Information Systems in PHC.** Given the heterogeneity of needs and the rapidly changing epidemiological picture there is a need for greater devolution of service planning to regions to reflect varied local needs. This will require substantial investment in local information systems and managerial capacity to assess health needs and plan services. Integrated health information
technologies are needed at PHC level to inform policy makers, purchasers, providers and users on the quality and efficiency of the PHC services provided.

The existing PHC information system needs to be expanded beyond the basic data collected. A core data set should be defined to better reflect the emerging NCD burden with a core set of indicators (aligned with international practice) that can capture efficiency and effectiveness of PHC providers. The new information system should have appropriate technical platforms and architecture (in-line with internationally adopted standards), and appropriate infrastructure to allow intra- and inter-organizational data sharing and two-way information flow between and within the different tiers of the health system (See Section 8 on HMIS).

5) **Strengthen Monitoring and Evaluation System for PHC.** Sections 3 and 4 have pointed out that there is one-way flow of information from PHC providers to organizations that gather data, without adequate feedback back to those who collect these and provide health services. Further, data collection systems are organized in a way that prevent linking of data on broad health determinants (such as lifestyle and risk factors), provider activities (such as utilization of services), costs, and outcomes (such as service quality, morbidity and mortality levels).

Monitoring and evaluation systems should be developed to create linkages between health determinants, utilization, costs and outcomes and to provide feedback to PHC providers to inform them of their activities and outcomes of their interventions, enabling them to reflect on their performance and modify their behavior.

6) **Develop Quality Assurance and Control Systems in PHC.** Continuous quality improvement (CQI) should be embedded into clinical practice and organizational principles. Each PHC organization (FM Team of FM Group Practice) should be responsible for undertaking clinical audit and to demonstrate good clinical practice and rational prescribing.

Clinical audit should be undertaken in areas where evidence-based guidelines have been introduced and should be team led. Clinical audit should be an integral part of the continuing professional development program.

7) **Refine Provider Payment Systems to Create Incentives and Link Payment to Performance.** Remuneration in PHC is based on salaries or fee for service. As the provider payment system does not adequately distinguish between high and low performers, there are no incentives for improving quality and efficiency. This limits ability of the PHC level to move beyond a gatekeeping role, broaden the scope of care, and achieve a secondary-to-primary shift.

Incentives should be introduced to improve service quality in PHC. For example, per capita payments could be combined with performance-related pay aimed at improving service quality. For example, bonus payments could be made to providers that meet set quality criteria. Additional payments could be provided for improving efficiency or reaching certain targets. A careful but strategic use of fee for service or “sessional” payments could be used for strengthening existing services or for introducing new services to manage chronic diseases. However, new payment systems which involve performance-related pay must be underpinned with robust health information systems that can capture timely and reliable data at individual provider and health professional level. Payment reforms are taken up again in Section 6.

8) **Improve Allocative Efficiency by Gradually Increasing Finances Allocated to PHC.** Regulations should be changed to increase over time (within five to eight years) the proportion of public and private resources (from state and social insurance and private insurers) allocated to PHC to levels in-
line with countries that face substantial burden due to NCDs. Typically, in European and many of the transition countries, around 30–35 percent of the total public and social health insurance expenditure is allocated to PHC. Currently, PHC spending by public and social insurance organizations is below 10 percent, and so is a fraction of EU-level percentage.

9) **Invest in PHC Structure and Equipment.** There is a need to develop a PHC infrastructure that is fit for purpose and adequately equipped to expand diagnostic and therapeutic capability to resolve problems at PHC level. Purpose-built PHC facilities, appropriately equipped with clinical and information technologies, are needed to create the right conditions that will allow expansion of services and enable provision more integrated approaches to service delivery.
Section 5
Hospitals and Secondary Services

With the weaknesses in its primary health care services, the health sector in the Islamic Republic of Iran is now witnessing an increase in the utilization of outpatient specialist and hospital services. What is the impact of this development? How cost-effective is this subsector? What are the patterns and dimensions of use? What are the past and current levels of quality and patient satisfaction? This section examines each of these issue areas. It begins with numbers and trends of facilities both hospitals and specialist services. Decentralization of provision is described, management and organizational pilots are reviewed, and performance to date is assessed. The section concludes by looking at issues of governance, regulation, and quality, as well as related areas of patient satisfaction.

Box 5-1: Summary Points

Utilization patterns suggest increased demands on outpatient specialists. It is not clear, however, how appropriate the demand for specialist care is, i.e., if specialists are seen for complex cases that require specialist care, or if many cases could be managed by general practitioners (GPs) or family medicine (FM) specialists.

Health inputs at the level of secondary services have been increasing. There are growing numbers of hospitals and hospital beds, particularly in the public sector.

The private sector accounts for the majority of outpatient services. The private sector’s role in provision of health services also has been growing significantly in the provision of laboratory services, diagnostic centers, radiology centers, and retail of pharmaceuticals.

Iran now has a higher number of MRIs per capita than in countries with comparable income levels.

Performance at the level of secondary services appears suboptimal in terms of technical efficiency of services. Bed occupancy rates have remained low. The average lengths of stay are much higher in the MOHME hospitals than in the private hospitals. This could be due to variation in case mix, or more probably due to higher levels of efficiency in the private sector.

The government has introduced some hospital autonomy and piloted several public–private partnerships in an effort to improve efficiency. These interventions need to be rigorously analyzed in order to guide policy makers.

The regulatory and quality assurance and quality improvement functions are managed by a unit in the MOHME, which may limit objectivity and independence and hinder overall performance.

Quality mechanisms focus heavily on inputs and not outcomes, and the results are not made public for the patients to make better informed choices. Clear guidelines need to be established for making explicit the sanctions/incentives for compliance with quality standards.

Numbers and Trends of Facilities

Hospitals

The government, through the Ministry of Health and Medical Education (MOHME), is responsible for providing most of the secondary health services in IR Iran. The MOHME accounts for 67 percent of hospitals in IR Iran, the private and nongovernmental sector comprises about 14 percent of total hospitals,
and other entities such as insurance organizations and other providers account for the residual. Private
and nongovernmental providers in IR Iran include for-profit and not-for-profit providers, as well as quasi-
governmental charity-based health service providers such as the Red Crescent Society and the Imam
Khomeini Foundation. Other ministries and organizations such as large private and public sector
enterprises (e.g., banks, oil companies, railways, armed forces, and municipal organizations) also provide
secondary and tertiary care, mainly for their own employees and their dependents.

Until 2004, the private sector was largely unregulated and there had been very little information about
private delivery of health services. This changed when a survey of all hospitals (MOHME 2006) in IR
Iran, both public and private, was conducted to estimate the unmet needs for health care services. The
level of government control over the private sector remains minimal by international standards and often
limited to the issuance of permits and licenses for technologies and additional beds, as well as modest
enforcement of quality standards through the evaluation and accreditation process.

Other Health Service Providers

In addition to the MOHME and private nongovernmental sector providers, there are other major providers
of health services in IR Iran. Access to services and choice of these providers is determined largely by
type of insurance coverage. There are several insurers each with a different benefits package, which
creates a complex maze of co-payments, referral- and counter-referral systems (see Section 7 for more in-
depth discussion).

The Medical Services Insurance Organization (MSIO), established under the National Health Insurance
Act passed by the Consultative Assembly in 1994, provides coverage for services not covered by the
primary health care network such as diagnostic services and treatment of illness and disease at the
ambulatory or hospital level. Those insured under the Rural Health Insurance System (part of the MSIO)
have the freedom to attend a public provider of their choice. The Social Security Organization (SSO) is
the second largest insurer and also the second largest provider of health services. The SSO operates 51
hospitals with 7,162 active beds (SSO 2003). These all operate under its direct system. It also contracts
with the MOHME facilities, the private sector, and foundations to provide services for its beneficiaries.

Persons covered by the Imam Khomeini Foundation (IKF) are able to access a closed system of hospitals
contracted by the Welfare Committee of the IKF. These persons can attend a secondary care provider
after referral from a GP.

Trends in Hospital Services

In recent years, the numbers of hospitals operated by the MOHME, the private and nongovernmental
sectors, and charitable trusts have increased (Figure 5-1). In 2007, there were 801 operating hospitals. Of
these, 532 were affiliated with the MOHME (operated by the provincial Medical Science Universities),
115 with private sectors operators, and 154 in other sectors such as the Bank Melli Iran, the National
Iranian Oil Company, National TV and Radio Networks, charitable trusts, and other ministries (e.g.,
Ministry of Education and Ministry of Social Welfare). Whereas over the past 20 years the number of
MOHME and 'other' hospitals increased, the number of private hospitals remained fairly constant.
Figure 5-2 highlights the number of hospitals by subsector today. The MOHME (operated by the
provincial Medical Science Universities) still accounts for the majority of the hospitals in IR Iran.
By 2007, 67 percent of the hospitals in IR Iran were owned by the MOHME, 14 percent were owned by the private sector, and 6 percent were owned by the SSO. Charitable organizations, the armed forces, and ‘others’ each accounted for 13 percent of the total (Figure 5-2).

The number of “installed” hospital beds (Figure 5-3) has also increased from 72,321 beds in 1986 to 113,244 in 2005 (the latest year for which the number of installed beds is available), representing a 57 percent increase. Despite the increase in the number of installed bed, the proportion of active beds was only 93,002, equivalent to 82 percent of the installed beds (Statistical Center of Iran 2006).
Figure 5-3: Number of Installed Hospital Beds by Year (1986–2005)

In 2007 there were 87,175 active beds in IR Iran. Of these, 62,391 were in MOHME-affiliated units, 8,375 in the private sector, 7,126 in SSO units, 2,207 in Charities (including IKF), and 5,954 in the provider units managed by other operators (Figures 5-4).

Figure 5-4: Number of Beds by Hospital Type (2007)

A comparison of the number of beds in IR Iran against the number of hospitals (Table 5-1) reveals that the MOHME hospitals, while accounting for 67 percent of all hospital facilities, account for 71 percent of hospital beds. In contrast, the private sector accounts for 14 percent of hospitals but only 10 percent of the total number of beds. The average number of active beds per hospital is much higher for the SSO (140) and MOHME (118) than for the private sector (73).
Table 5-1: Bed Hospital Ratio (2007)

<table>
<thead>
<tr>
<th>Type of Hospital</th>
<th>Hospitals</th>
<th>Proportion of Total</th>
<th>Active Beds</th>
<th>Proportion of Total</th>
<th>Beds/Hospital Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical university</td>
<td>532</td>
<td>0.67</td>
<td>62,691</td>
<td>0.71</td>
<td>118</td>
</tr>
<tr>
<td>Private sector</td>
<td>115</td>
<td>0.14</td>
<td>8,375</td>
<td>0.1</td>
<td>73</td>
</tr>
<tr>
<td>Social security organization</td>
<td>51</td>
<td>0.06</td>
<td>7,126</td>
<td>0.08</td>
<td>140</td>
</tr>
<tr>
<td>Charitable organization</td>
<td>25</td>
<td>0.03</td>
<td>2,207</td>
<td>0.03</td>
<td>88</td>
</tr>
<tr>
<td>Armed force</td>
<td>17</td>
<td>0.02</td>
<td>822</td>
<td>0.01</td>
<td>48</td>
</tr>
<tr>
<td>Others</td>
<td>61</td>
<td>0.08</td>
<td>5,594</td>
<td>0.07</td>
<td>98</td>
</tr>
<tr>
<td>Total</td>
<td>801</td>
<td>1</td>
<td>87,175</td>
<td>1</td>
<td>101</td>
</tr>
</tbody>
</table>


Geographic Distribution of Hospitals and Beds

There are also variations by province in the number of hospitals as well as the number of hospital beds. For example, Figure 5-5 illustrates the comparison of the proportion of beds against the proportion of total hospitals by province. In most provinces, the proportion of the total number of beds the province accounts for is similar in size to the proportion of total hospitals. However, Tehran emerges as somewhat of an outlier, accounting for a greater percentage of total beds (26 percent) than of total hospitals (19 percent), suggesting both greater bed capacity per capita as well as larger facilities in Tehran on average.

Figure 5-5: Hospitals per Bed by Province (2005)


In 2005, there were a total of 93,002 active beds in the country including public, private, and other facilities (MOHME 2005). This amounts to a national average of 1.37 beds per 1,000 populations in IR Iran. There are, however, variations by province from low ratios in Sistan and Baluchistan (0.81) and Khokiluye and BugerAhmad (0.84), to much higher ratios in Tehran (1.99) and Yazd (2.31). Tehran, with about 26 percent of the beds in the country, skews the average ratio of hospital beds per 1,000 populations upward. The average number of beds per population in the rest of the country, excluding Tehran, is 1.23.
Figure 5-6 illustrates the distribution of hospital beds and hospitalizations by sector. The MOHME accounts for nearly 70 percent of hospital beds but a slightly lower proportion of hospitalizations. The SSO and the private sector have higher proportions of hospitalizations than their respective proportions of hospital beds. This might suggest some under-utilization within MOHME hospitals or perhaps, a more efficient use of services in the private sector and SSO.

**Figure 5-6: Beds and Percentage Hospitalized by Sector**

![Bar chart showing distribution of hospital beds and hospitalizations by sector](image)

*Source: SCI (2006).*

**International Comparison of Numbers of Hospital Beds**

Figure 5-7 compares the number of beds per population in IR Iran with other countries. The general trend is that this ratio has increased with an increase in per capita GDP. IR Iran is located almost on the regression line, which suggests that the number of beds per capita in IR Iran is similar to the average for countries with comparable levels of per capita GDP.

**Figure 5-7: Global Trend Analysis of Bed Capacity (2002)**

![Graph showing global trend analysis of bed capacity](image)

*Source: WHO, OECD, and World Bank estimates (2002).*
Emergency Services

A ‘Comprehensive Emergency Coverage Plan’ was recently developed by the MOHME to strengthen the emergency referral system. Three levels of emergency centers were created:

1) City bases, which cover populations of 250,000 or more;
2) City road bases, in cities with populations of less than 250,000; and
3) Road bases on main inter-city roads.

As part of this Plan, 420 emergency centers were established and equipped with 1,500 ambulances, dedicated radio communication network, and staffed by over 8,000 trained emergency paramedical staff. The emergency units have a target of reaching 80 percent of all cases within eight minutes of being contacted (SCI 2006).

Diagnostic Services

There were 2,046 radiography centers in IR Iran as of 2004, most of which were located within the private sector (SCI 2006). The public sector (i.e., the MOHME and its affiliates) accounted for a greater proportion of radiography centers 10 years ago. However, over time, the private sector has grown to account for a higher proportion of radiography centers, as illustrated in Figure 5-8. The number of private centers increased by 176 percent from 352 in 1986 to 972 in 2004, whereas the MOHME affiliated centers only increased by 39 percent within the same period.

Figure 5-8: Numbers of Radiology Centers (1986–2004)


17 Data for analyzing the performance of emergency services was not made available at the time of this draft.
Medical technologies such as MRIs and CT scans are concentrated in provinces with big cities such as Tehran and the Fars province. By April 2007, there were a total of 100 MRI machines and 285 CT scan machines within MOHME facilities (5 MRI and 13 CT scan machines are under construction.), an increase from the 2005 numbers of 45 MRI and 237 CT scan machines (Figure 5-9).

Figure 5-9: Distribution of MRI and CT Scan (2007)

This indicates that IR Iran had 1.5 MRI per million population and 4.4 CT scan machines per million populations in 2007. Figures 5-10 and 5-11 compare the numbers of MRI and CT scan per million populations between IR Iran and selected OECD countries. IR Iran has a similar number of CT scans, but a higher number of MRI per capita than countries with comparable per capita GDP.

Figure 5-10: Global Trend in the Number of MRI Per Capita Relative to Per Capita GDP (2003–2007)


MOHME, data provided in April 2007.
Laboratories

The majority of laboratories are still owned by the MOHME. The number of labs in 2004 was 4,126, representing an increase of 163 percent from its 1986 level of 1,563. Of the total MOHME-affiliated labs, the number of laboratories increased from 1,132 to 1,988, reflecting a 75 percent increase over the course of two decades. However, MOHME laboratories as a proportion of total laboratories decreased from 72.4 percent to 48 percent. This trend downward paralleled an over 300 percent increase in the number of private laboratories, which currently accounts for 39 percent of total laboratories. If this trend continues, private labs may surpass government-owned labs in the future (Figure 5-12).


Figure 5-12: Laboratories in IR Iran (1986–2004)

Pharmacies

The pharmaceutical retail sector is heavily dominated by the private sector. Most pharmacies (91 percent) are privately owned, as illustrated in Figure 5-13. This has been attributable to an exponential increase (171 percent) in the number of pharmacies over the past two decades, mostly due to an increase in the participation of the private sector that has led to the proliferation of private pharmacies. This is taken up in more depth in Section 7 on Pharmaceuticals.

![Figure 5-13: Numbers of Pharmacies](image)


Decentralization in Provision of Services

Iranian health services operate in a somewhat decentralized manner. Substantial decision making responsibility and authority has been transferred from the central unit to more peripheral units, mainly the provincial level. Different concepts and approaches have been attempted in IR Iran, some of which will be discussed below; however, the most obvious form of decentralization in place is deconcentration from the central Ministry of Health and Medical Education to the provincial level medical universities, which are responsible for medical education as well as service delivery within their respective provinces. The impetus for this reform was the approval in 2005 of the Fourth Five-Year Development Plan in which Article 49 allowed for direct transfer of global budgets from the government (MPO) to medical universities, which could then use their discretion to allocate resources as needed. The medical universities, headed by the chancellor, acts as a sort of ‘provincial minister of health’ because of the substantial authority he/she has in directing health affairs in the province. The minister of health appoints the chancellor and is represented at the head of the University Board. The role of the central MOHME includes health policy, regulatory guidance, and the provision of oversight (monitoring, evaluation, and so on) over the provinces.

At the provincial level, authority is not significantly decentralized below the medical universities, except at the district health center, which has been historically responsible for primary health care programs.

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19 See, for example, Anne Mills, et al, “Health System Decentralization: Concepts, Issues and Country Experience” WHO, 1990. In the case of IR Iran, only administrative authority is transferred. Political authority is not included in this transfer of power to the provinces, which would otherwise have been the case in ‘devolution’ as a form of decentralization. The provincial health authorities are still under the jurisdiction of the Central Ministry of Health and not the local provincial administration.
Thus, there is a type of re-centralization at the provincial level. This may be partly due to the dual roles of medical education and service delivery played by the MOHME, which makes it more difficult to decentralize below the level of the provincial medical universities.

Under this model, decentralization of service delivery responsibilities below the provincial level is thus limited to the primary health care network and preventive services. Medical education is further decentralized only as it pertains to the training of behvarzes, who are community health workers and are overseen by the district health center as part of its role in the coordination of the primary health network.

It remains unclear how the universities allocate resources between medical education and service provision, and between the different levels of service delivery within the province. At the moment, the allocation from the MPO is primarily based on the norms pertaining to staffing and capacity of facilities within the province and for supporting specific national priority programs. There is limited fiscal space for any significant reallocation of financial and other resources for specific programs/interventions tailored to local priorities. Other approaches to decentralization that have been attempted on a pilot basis in IR Iran include hospital autonomy, contracting, and outsourcing services to the private sector.

Public Sector Hospital Management and Organizational Reform

Hospitals in IR Iran have undergone some form of organizational changes, from line item budgetary units to somewhat more autonomous entities in recent years. There have also been pilots of autonomization, but these have not yet been fully evaluated. In addition, other approaches have been attempted such as contracting management functions and outsourcing of ancillary services. The experience has been mixed, and the discussion below provides some insight to the experience in IR Iran.

Hospital Autonomy

The degree of organizational reforms for health facilities leading to more autonomy could be examined, using the model developed by Preker and Harding (Jakab et al. 2002). This model posits different levels of autonomy—from traditional public organizations, to more “autonomized organizations,” quasi-private or “corporatized organizations,” fully privatized organizations—and evaluates these models against organizational functions of the hospital across five dimensions, namely:

1) The Level of Management Autonomy (Decision Rights): That is, the ability to make decisions over various aspects of production, including inputs, processes, outputs, and outcomes. It includes the ability to set a strategic direction for the hospital;

2) Residual Claimant Status: The extent to which an organization is able to retain its savings or earned revenue, as well as the degree of risk it bears for financial losses and debt;

3) Market Exposure: The process of subjecting hospitals to competition in the product market (in which revenues are linked to the performance of the hospital), and factor markets (where hospitals compete for inputs such as financing and human resources);

4) Accountability: The extent to which hospitals are directly responsible and answerable for their behavior and performance. Here, the ability of the hospital to institute its own accountability mechanisms such as through contracts, an independent board, and the degree of direct influence of the MOHME and medical universities; and

5) Social Functions: The extent to which the hospital institutes have an explicit and funded mandate to provide services of social value to patients, or to indigent patients, particularly where the marginal cost of producing such a service is greater than the marginal revenue received for rendering the service.
A summary schematic is provided in Figure 5-14.

**Figure 5-14: Incentive Regimes and Organizational Framework**

<table>
<thead>
<tr>
<th>Key Elements of Incentive Regimes</th>
<th>Autonomized Unit A</th>
<th>Corporatized Unit C</th>
<th>Privatized Unit P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision Rights</td>
<td>Vertical Hierarchy</td>
<td>Management Authority</td>
<td></td>
</tr>
<tr>
<td>Income Retention</td>
<td>Public Purse</td>
<td>A</td>
<td>C Private Owner</td>
</tr>
<tr>
<td>Market Exposure</td>
<td>Direct Budget Allocation</td>
<td>Payment for services</td>
<td></td>
</tr>
<tr>
<td>Accountability</td>
<td>Direct Hierarchical Control</td>
<td>Regulation and Contracts</td>
<td></td>
</tr>
<tr>
<td>Social Functions</td>
<td>Unspecified, Funded and Regulated</td>
<td>Specified, Funded and Regulated</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Preker et al. (2002).*

Given the legal cover under Article 192 (Second Five-Year Plan), a process of autonomy was introduced for hospitals. The process involved an adjustment of financing mechanisms from direct budgetary allocations to one that would be financed through payments to hospitals under the social insurance scheme. The aim was to introduce some market exposure and keep the hospitals as the residual claimants of the revenue generated. The managerial autonomy and authority of senior hospital managers was, however, still limited and the social functions of the hospital were neither made explicit nor adequately resourced. The hospitals could not expand significantly in response to demand or establish private wards for patients willing to pay more for the extra service. A recent report by Collins (2005) cited a case of one of the hospitals under a pilot scheme, the Shariati University Hospital in Tehran, which was managed by a director who was appointed directly by the university chancellor. Hospital income was primarily generated from a line item budget direct from the government, through the University, for staff. The hospital had a cap of USD 10,000 that it could re-allocate without requiring prior approval. Staff appointments had to be made through the Tehran University of Medical Sciences upon recommendation of the management.

This process was based on the premise that a new policy enacted in 1995 would extend universal social health insurance. However, the universal social health insurance plan did not occur; this resulted in frequent denial of access to hospital services to those without insurance, creating significant resentment and resistance within the community, and eventually, among members of parliament and health managers. The reform was perceived as a step toward privatization, which was feared, would lead to lack of access to health care for the majority of the poor and near-poor. The result was a repeal of the policy on hospital autonomy. As a consequence, today there appears to be significant opposition to any future attempts to introduce significant hospital autonomy (Collins 2005).

Some provincial level facilities also were partially decentralized with management and operational powers delegated from the chancellor of the medical university, in keeping with article 49 of the Fourth Five-Year Plan. The chancellor still exercises significant control and oversight of hospital affairs.
Decision Rights. Public hospitals are managed by a director, appointed by the chancellor of the medical university. In addition, there is a constituted board, which plays an advisory role and can be dissolved by the chancellor. The budget for public hospitals consists of a combination of a fixed allocation from the government, and fee for service revenue from insurance organizations, for procedures carried out or services delivered. However, hospital management does not always have flexibility over how it can use these resources. The director of the hospital is appointed by the chancellor of the university, and the strategic direction of all hospitals is determined by the chancellor. Hospitals are not authorized to borrow private funds unless they are granted explicit approval by the chancellor of the provincial medical university. The director cannot make any acquisitions or disposal of land and or buildings owned by the hospital.

Hospital management has minimal decision rights over recruitment or remuneration of civil servants. These are determined by the medical university. The hospital director, however, can recruit local employees and contract staff. The hospitals under the SSO can contract only support staff and only for short-term contracts, which can only be conducted through corporate organizations and not by direct hire. The Medical Services insurance Organization (MSIO) has arrangements similar to the SSO.

Market Exposure. Facilities do not compete for patient flow because of the structured referral and payment systems. Market exposure, instead, is limited to a few areas, such as some competition for human resources. Until about three years ago, all employees in the hospitals were hired on a permanent basis by the MOHME, and civil service laws made it difficult to hire or fire staff. Today, hospitals have some flexibility to hire employees on a contractual basis. The hospitals, therefore, have some autonomy in spending their revenue and, within certain guidelines, can contract some staff and terminate their contracts. Therefore, there is some room for competition with other hospitals to attract very good and competent staff. This is limited, given the fact that there appears to be an oversupply of health workers, especially in the urban areas, with many doctors finding it difficult to find employment. The price for services provided is often fixed and, therefore, hospitals cannot compete on price. Finally, hospitals cannot compete on objective measures of quality as results of hospital evaluations are not published; hence the consumer cannot make informed decisions on provider choice.

Residual Claimant Status. Hospitals can retain some revenue/income and use part of it for other projects or development such as through the purchase of minor equipment or contracting new providers. However, hospitals are not liable for any losses incurred. If a hospital runs a significant deficit, it will make requests to the medical university with jurisdiction over them. This makes the medical university the ultimate residual claimant. The hospital may also make a request to the MPO for increased subventions, and this may be granted through a process that is not explicit. However, the hospital is usually advised to embark on some cost-saving reforms as part of an agreed deficit relief.

In addition, about 5 percent of the hospital’s income goes to the medical university, which is put into a pool administered by the medical university and then used for assisting hospitals in financial distress. The government also provides financial assistance for special cases that are usually very expensive to treat, such as psychiatric conditions, rare conditions, and severe burns.

Accountability. Public hospitals are accountable to the medical university in the province through the office of the deputy for Curative Services and Treatment. However, the level of authority is limited to the issuance of permits, monitoring and evaluating hospital performance, and the provision of technical support and education, when needed. There is a hospital board, headed by the representative of the medical university chancellor. Its role is primarily advisory in nature, and its powers are limited and can be dissolved at anytime by the chancellor.
At the lower level of the PHC system, the districts operate as autonomous entities and have oversight responsibilities over the health houses and the health centers (rural and urban). The district health centers are accountable to the Majlis as well as to the deputy for Health in the medical university in the province, who in turn is accountable to the chancellor.

**Social Function.** A recent law has mandated that all hospitals provide care to the poor, based on the premise of universal health care coverage for the poor. Under this scheme, a special fund was established by the Majlis for reimbursing hospitals for providing care for the poor and for individuals facing catastrophic health expenditures. This fund is administered by the MSIO and covers 90 percent of the medical costs; the patient is expected to pay 10 percent. This latter portion has often proved difficult to reclaim. It is estimated that about 3 percent of persons admitted in hospitals incur catastrophic expenditures. In addition, several entities like the Red Crescent, and the Imam Khomeini fund, have their special social mandates to provide care for certain segments of the population. During one recent public hospital visit, it was observed that there were no special accounts or budgets for patients who could not pay for care. A social worker is usually provided to assist concerned families, but this social service may not be adequately funded, and the execution of this service is often at the discretion of the hospital.

**Summary Assessment: Hospital Autonomy**

The level of autonomy the public hospitals in IR Iran is neither uniform nor consistent across the five parameters assessed under this model. For instance, the hospital management and board have very limited decision rights in terms of their income stream and resource allocation. Resources cannot be easily redirected to other areas of the facility, for example, to build more coronary care unit (CCU) beds, without permission or authorization from the medical university and the Ministry of Health, regardless of need or demand. Financing cannot be obtained from alternative, private sources. In addition, although there is little control over permanent staff, some flexibility has been introduced in the hiring of new staff on a contractual basis, where the contracts can be renewed or terminated as needed. However, this has been applied mostly to the recruitment of support staff and, to a lesser extent, general practitioners rather than specialists. Permanent staff cannot be fired to reduce redundancies, for performance-related issues or as otherwise indicated.

Market exposure is limited; the payment structure (i.e., of paying a fixed amount per hospital bed) creates an incentive for overcapacity. Accountability stems from hierarchical supervision from the medical university and the MOHME, which are far removed from the day-to-day operations of the hospital, and tends to focus mostly on specific inputs. There are no clear outcome-based performance targets negotiated between the hospital and the MOHME.

Finally, social functions appear to be more explicit. Some institutions like the Imam Khomeini Foundation have an explicit social function, and there is the recently funded mandate to provide services for the poor and uninsured. However, ensuring the fund is easily accessible poses a different challenge. In addition, the 10 percent that should be recovered from the patient tends to be offset by the hospital because the patients are often too poor to afford even that amount.

**Public—Private Partnerships in the Iranian Health Sector**

Under the Third Five-Year Plan, explicit instructions were elaborated to encourage the involvement of the private sector in providing health services, as part of efforts to improve the efficiency of health service delivery. Two principal approaches were used, including the:

- Transfer of management (but not ownership of assets) of health facilities to the private sector; and,
Outsourcing of entire functions within the hospital, to the private sector, most of which were support services.

**Contracting Management of Facilities**

In 2000, the MOHME began piloting the transfer of health facilities’ management to the private sector (e.g., cooperatives, private persons/companies, and NGOs). Article 192 of the Third Five-Year Plan authorized provincial universities to develop strategies for delivering health services to urban areas, especially in areas not adequately covered by public services, using cooperatives. This aimed to fill perceived gaps in public health service delivery and better harness the growing demand for private provision of health care in urban areas. The process was initially conducted in seven provinces and then expanded to about 40 hospitals throughout the country (Green 2005). It involved the submission of proposals by provinces that detailed the service package, financing, and monitoring and evaluation mechanisms. Notably, rural health houses were exempted from this process.

The expansion of these transfers throughout the country has been accompanied by a reduction in the aforementioned centralized control over the transfer process. Article 192 also allows public employees working in a newly transferred service to remain as public employees but to work for new private managers. Article 192 actually requires at least 20 percent of the existing staff work for the new privately managed service. All other public employees displaced by the process are to be transferred within the public sector.

Table 5-2 shows the number of facilities involved in this process of contracting management to the private sector over a three year period. Data to ascertain the impact of this process on health outcomes, costs, and service quality has been unavailable.

<table>
<thead>
<tr>
<th>Areas of operation</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban health centers</td>
<td>83</td>
<td>120</td>
<td>11</td>
</tr>
<tr>
<td>Health posts</td>
<td>19</td>
<td>86</td>
<td>172</td>
</tr>
<tr>
<td>Rural health centers</td>
<td>8</td>
<td>14</td>
<td>24</td>
</tr>
<tr>
<td>Radiology</td>
<td>10</td>
<td>23</td>
<td>15</td>
</tr>
<tr>
<td>Laboratory services</td>
<td>6</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>Pharmacy and other preclinical areas</td>
<td>4</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>Hospital wards</td>
<td>5</td>
<td>57</td>
<td>271</td>
</tr>
<tr>
<td>Emergency services</td>
<td>6</td>
<td>35</td>
<td>51</td>
</tr>
<tr>
<td>Total</td>
<td>141</td>
<td>360</td>
<td>568</td>
</tr>
</tbody>
</table>

*Source: Collins (2005).*

**Contracting Services**

Since 2002, there has been a rapid expansion of outsourcing health care services from government health facilities to the private sector (Collins 2005). Article 88 of the Third Five-Year Plan articulates the provisions for outsourcing, primarily targeting support areas of public health services. This process has been led by the office of the Deputy Minister for Logistics and Management Development. Services outsourced include: transportation, cleaning, security, catering services, IT, gardening, sterilization
services, and equipment maintenance. Some hospitals have expanded the scope of outsourced services to include contracting with nursing agencies to provide back-up support for acute staff shortages.

An evaluation of 41 pilot hospitals in IR Iran indicated that, within a two year period, 88, 81, 73, 66, and 37 percent of the pilot hospitals had outsourced cleaning, catering, gardening, laundry, and central sterilization room functions respectively. Reports on the success of this approach have been mixed, however. Some of the positive effects have reportedly produced savings in money and staff time, and better service quality. Notably, reports also highlighted negative effects, namely: lack of expertise among hospital managers in contracting, and scarcity of a strong private sector to participate in the outsourcing process. Yet, most of this information has been anecdotal and there has been no data available to fully evaluate the outcome of the pilots.

Contracting has been possible largely because of the development of the private sector over time. The private sector remains largely concentrated in the urban areas and plays an increasingly important role in secondary and tertiary level care services. Almost the entire pharmaceutical industry and drug distribution system is private as is a large share of laboratory and diagnostic facilities.

**Measuring Access and Utilization of Health Services**

A systematic assessment of health service utilization in IR Iran was conducted in 2002 as part of a nationally representative Health Service Utilization Survey. This survey determined that, on average, each Iranian had approximately 8.7 encounters with the health care system annually. Of these, 5.5 visits were made in the private sector and 3.2 in the public sector, as noted in Table 5-3.20

<table>
<thead>
<tr>
<th>Provider Type</th>
<th>Average Number of Visits/Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Physician</td>
<td>2.2</td>
</tr>
<tr>
<td>Specialist Physician</td>
<td>1.2</td>
</tr>
<tr>
<td>Dentist</td>
<td>0.3</td>
</tr>
<tr>
<td>Midwife</td>
<td>0.1</td>
</tr>
<tr>
<td>Nonphysician</td>
<td>1.3</td>
</tr>
<tr>
<td>Advisor</td>
<td>0.01</td>
</tr>
<tr>
<td>Rehabilitation Specialist</td>
<td>0.03</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>2.9</td>
</tr>
<tr>
<td>Paraclinic</td>
<td>0.7</td>
</tr>
</tbody>
</table>

*Source: MOHME (2002).*

Section 4 noted that the average number of ambulatory care visits was 8.4 per year. The average number of hospitalizations was 6.1 percent of population per year in 2002. Approximately 82 percent of hospitalizations occurred in government facilities, and only 18 percent occurred in private facilities. For ambulatory care, however, 66 percent occurred in private facilities, whereas 34 percent occurred in government facilities. This is consistent with the fact that the private sector accounts for only 10 percent of hospital beds in the country as discussed earlier in the section.

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20 Data obtained from the summary of a report on the 2002 Health Utilization Survey conducted by the MOHME Iran. Methodology involved a random selection of 3,500 families with proportional representation from rural and urban areas of all 28 provinces in the country. A total of 16,955 respondents were surveyed.
Available data (Figure 5-15) show that Iranians seek ambulatory and outpatient services, both primary and specialist care together, more than twice per capita than in other countries in the MENA region, which were four visits per year. The frequency of visits per capita is higher than in many EU countries and high income OECD countries. The exception is the post Soviet countries such as Czech Republic, which have a history of over utilization.

**Figure 5-15: Outpatient Visits Per Capita: IR Iran, EU, and Selected Middle Income Countries (2000–2002)**

![Bar chart showing outpatient visits per capita for different countries](image)

*Source:* OECD (2005); MOHME (2002); WHO HFA-DB; and, National Statistical Office Thailand (2003).

*Note:* Doctor visits per capita were used for EU countries for a comparison purpose. For MENA countries, the available data between 1990 and 1998 were used.

Similarly, available data from the late 1990s (Figure 5-16) show that IR Iran’s inpatient admission rate is lower than the majority of OECD countries, but comparable with the rest of the MENA countries.
According to the Health Service Utilization Survey, the group with the highest hospitalization rates were the >65 year olds (18.2 percent) and infants (14.3 percent). Those least likely to be hospitalized were the 5–14 year olds (2.4 percent). Women were hospitalized more frequently than men (i.e., hospitalization rates of 7 percent for women and 5.2 percent for men).

The average time from referral to actual hospitalization, when indicated, was approximately two days. This ranged from 0 (same day) for infants, to 3.6 days (for >65 year olds). If the hospital was located within the same city as the patient (as occurred in 68 percent of cases), the average hospitalization was two days. If the hospital was located in another city within the same province (as occurred in 26 percent of cases), as in the example of specialized care, hospitalization was about 3.7 days. No data was available on referrals made to hospitals outside the province. Reasons for delays in admission included financial constraints on the part of patients, as well as the choice by patients to defer seeking health care.

Table 5-4 shows the average per capita utilization of one insurer, the Social Security Organization (SSO), over five years.
Table 5-4: SSO Utilization (2001–2005)

<table>
<thead>
<tr>
<th>Per Capita Average Use per Service by Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Practitioner</td>
<td>1.90</td>
<td>2.06</td>
<td>2.04</td>
<td>2.12</td>
<td>2.09</td>
</tr>
<tr>
<td>Specialist</td>
<td>1.05</td>
<td>1.12</td>
<td>1.12</td>
<td>1.20</td>
<td>1.24</td>
</tr>
<tr>
<td>Dentist</td>
<td>0.15</td>
<td>0.16</td>
<td>0.15</td>
<td>0.17</td>
<td>0.18</td>
</tr>
<tr>
<td>Pharmacies</td>
<td>3.39</td>
<td>3.48</td>
<td>3.45</td>
<td>3.79</td>
<td>3.81</td>
</tr>
<tr>
<td>Laboratory</td>
<td>0.35</td>
<td>0.38</td>
<td>0.38</td>
<td>0.45</td>
<td>0.46</td>
</tr>
<tr>
<td>Imaging, of which</td>
<td>0.18</td>
<td>0.21</td>
<td>0.21</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Radiology</td>
<td>0.11</td>
<td>0.13</td>
<td>0.13</td>
<td>0.14</td>
<td>0.14</td>
</tr>
<tr>
<td>Sonography</td>
<td>0.07</td>
<td>0.08</td>
<td>0.09</td>
<td>0.11</td>
<td>0.11</td>
</tr>
<tr>
<td>Rehabilitation</td>
<td>0.02</td>
<td>0.02</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>Admissions (percentage of population)</td>
<td>6.67</td>
<td>6.85</td>
<td>7.93</td>
<td>8.50</td>
<td>8.74</td>
</tr>
<tr>
<td>Other (EKG/ Injection/ MRI/ CT Scan, etc.)</td>
<td>1.70</td>
<td>1.61</td>
<td>2.12</td>
<td>2.10</td>
<td>2.19</td>
</tr>
</tbody>
</table>

Source: SSO data collected by the National Health Sector Reform Unit (2007).

The data presented in Table 5-4 illustrate a clear trend of increasing utilization of health services within the SSO system, including a 31 percent increase in admissions per capita, a 57 percent increase in the use of sonography, a 31 percent increase in the use of laboratories, and an increase in the usage rate for specialists that is twice that for GPs. These trends are significant and suggest greater use of high-end specialist care consistent with findings in Section 5, and could have implications on growing expenditures on health services in IR Iran.

A similar trend is observed in utilization of services with other insurers as illustrated in Figures 5-17 and 5-18.

Figure 5-17: MSIO Utilization (2000–2003)

Source: Kermani (2004).
Evaluating Performance at the Hospital and Secondary Services Level

Efficiency of Health Service Delivery

Figures 5-1 and 5-3 indicated that the numbers of beds and hospitals have continued to increase in the last decade. In particular, the increase of hospital beds in the MOHME hospitals and other sector (e.g., oil companies and Imam Khomeini Foundation) has been more rapid than ones in the private sector. Compared to other countries in the region and relative to the OECD, the statistics for IR Iran remain relatively low as shown in Figures 5-19 and 5-20.

Source: Kermani (2004).

Source: WDI (2005).
Figure 5-20: Beds per 1,000 Population: IR Iran, EU, and Selected Middle Income Countries (2002)

At the same time, a second measure of efficiency, the bed occupancy rate, is low and consistently so across subsectors (Figure 5-21). Levels are far below suggested international standard level of 80–85 percent (Figure 5-22). Variations of BOR across subsectors range from 35.4 percent to 75 percent. The SSO BOR is highest at 75 percent, followed by the MOHME hospitals at 70 percent in 2006. The private sector, which operates the second largest number of hospital beds in the country, has only 52.9 percent of BOR. The BORs in hospitals operated by the Armed Forces and Oil companies are at less than 40 percent.

Figure 5-21: Bed Occupancy Rate (2006)

Figure 5-22: Bed Occupancy Rate: IR Iran, EU, and Selected Middle Income Countries (2002–2006)

For MOHME hospitals, numbers are available by province. Figure 5-23 shows the relationship between the hospital beds per capita across provinces in IR Iran and the bed occupancy rate (BOR). There is a modest inverse correlation; suggestive that the greater number of beds per population the greater the likelihood that the average BOR in that province will be lower.

Figure 5-23: Bed Occupancy Rate and Bed–Population Ratio

A third measure of efficiency, average length of stay (ALOS) per admission, indicates a slightly different picture on the hospital sector in IR Iran. The ALOS is relatively low by international standards (Figure 5-24) consistently across all organizations (Figure 5-25). In 2006, the ALOS for all hospitals was about 3.14 days. While data profiled by days of stay were not made available, low ALOS may reflect high numbers of patients who stay for one to two days. If true, this may reflect poorly on sector performance as patients of one to two day stays may be better treated at less cost in outpatient centers. In nearby Lebanon, for example, 53 percent of all surgeries are one day admissions, most of which are treatable in an outpatient setting where costs are, on average, 30 percent less.
The ALOS was lower in private hospitals (2.2 days) than in government hospitals (3.38 days) (MOHME 2006). This difference could be explained, in part, by the variations in patient case mix for the government and private hospitals. For instance, data comparing the public and private sector by type of ward reveals that, in public hospitals, the long ALOS was primarily attributable to wards catering to transplant patients: kidney transplant wards (11.5 days), liver transplant wards (15.5 days), and bone marrow transplant wards (26 days). These wards were not found in the private sector. At the same time, the private sector might be more efficient in the management of patients, because for nearly all of the procedures found in both the private and public sector, the private sector consistently recorded lower ALOS. This might reflect a superior model for managing care. The ALOS for substance abuse and psychiatric care was high, for both public and private, again perhaps reflecting prevalent case management models in the country that tend to be very hospital-based.

**Figure 5-24: Average Length of Stay: IR Iran, EU, and Selected Middle Income Countries (2002–2006)**

![Graph showing ALOS comparison between Iran and other countries](image)

*Source: OECD (2005) and MOHME (2002).*
Figure 5-25: Average Length of Stay across Health Sector Organizations
(2006)


Figure 5-26 shows the ALOS and BOR by province in 2006. Only the provinces of North Khorazan and Fars exceed 80 percent occupancy. There does not appear to be any correlation between ALOS and BOR at provincial levels.

Figure 5-26: Hospital Average Length of Stay and Bed Occupancy Rates by Province (2006)


The absence of good information on health outcomes, case mix, or readmission rates limits the usefulness of any interpretation of these data. National data are only cross-sectional.
Trend data are available for the MOHME hospitals, where the average BOR has improved modestly over time. The average BOR for the year 2005 was 64.98 percent, an increase from a rate of 57 percent in 2001. However, there is significant variation in the BOR across provincial medical university hospitals under the MOHME. The BOR in 2005 varied from 50.9 percent in Ilam to 76.6 percent in Golestan (Figure 5-27). For the three year average (2003, 2004, and 2005), the lowest BOR was in Bushehr (50.13 percent) and the highest in Golestan (72.13 percent).

Figure 5-27: Bed Occupancy Rates by Province, MOHME Facilities (2003 and 2005)

A fourth measure of efficiency is admission rate. On average, the admission rate for MOHME hospitals in 2005 was 6.1 percent of population, low by international standards as pointed out in Figure 5-16. The relatively young population profile may contribute to this low admission rate. Again, however, there is significant variation across provinces, ranging from 3.89 percent in Qazvin to 10.85 percent in Semnan.

Governance, Regulation, and Quality

As noted in Section 3, the MOHME is the primary body responsible for oversight of the health system in IR Iran. The MOHME has the legal authority to oversee, license, and regulate the activities of the private sector. Most of the other supervisory and regulatory functions are conducted by MOHME itself or by the Universities of Medical Sciences on its behalf in the provinces. Other nongovernmental bodies also play a role in regulation. For instance, the Islamic Republic of Iran Medical Council (IRIMC) is a nongovernmental organization that also regulates the relationship of most health care professionals with the government. It is involved in the licensing of medical professionals and acts as a union for the medical community.

Most of the oversight of hospitals is based on inputs. Evaluation and regulation of health care provision in IR Iran is done mainly through three methods: (i) licensure and issuance of permits; (ii) accreditation; and, (iii) use of incentives/disincentives. The results of the evaluations are not made public; hence, users cannot make fully informed decisions on quality in their choice of hospitals.
Licensing/Permits

All health care organizations, from hospitals to physicians’ offices, governmental or non-governmental, must be licensed by the MOHME or the Universities of Medical Sciences. According to the first clause of the Organization and Functions of the Ministry of Health Act of 1988, the Ministry is also responsible for regulating and standardizing pharmaceuticals and medical equipment and is required to strictly regulate drug prices.

Licenses are required before a hospital is established or before the capacity of an existing hospital is expanded or reduced. Licenses, therefore, require a justification of need, a demonstration of consistency with the plan of the MOHME, and the projected needs of the province, which is calculated based on surveys of capacity, the number of hospital beds, and the local population. Other considerations (e.g., political, academic, and local pressures) are often factored in and may weigh heavily on the decision to issue or restrict a license for a new or existing hospital. The issuance of permits and licenses has thus far not been effective in ensuring a rational and efficient allocation of hospital services, as overcapacity/underutilization is still pervasive.

A primary permit is required for establishing new hospitals or diagnostic centers. This is normally valid for two years and, within that time period, it is expected that service provision would have commenced otherwise, the license would not be renewed. If service has commenced, then a ‘more permanent’ license is provided and its renewal is subject to the satisfactory performance of the hospital as determined during the survey/accreditation process.

Accreditation/Quality Management

Experience with accreditation in IR Iran began in 1997. This involved the use of standardized questionnaires that were administered in two parts. The first part (Part A) was used in evaluating the Emergency Department of hospitals. The second part (Part B) evaluated the other departments. In Part A, the maximum score obtainable was 1,800 for which the facility would be rated excellent. The various domains that were assessed under Part A included: manpower; ethics; physical standards; medical equipment and supplies; and, nonmedical and safety equipment, others, and safety standards. Part B assessed: manpower (medical, nursing and administrative); hospital management; ethics; safety equipment; and, nonmedical equipment; physical standards; hygiene; hospital committees; education and research; and CCU and ICU (Karbakhsh 2007). The obtainable rankings are noted in Table 5-5.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Score (Emergency Room)</th>
<th>Score (Other Departments)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>1673–1873</td>
<td>&gt;20876</td>
</tr>
<tr>
<td>Degree 1</td>
<td>1512–1672</td>
<td>18367–20875</td>
</tr>
<tr>
<td>Degree 2</td>
<td>1352–1511</td>
<td>15876–18366</td>
</tr>
<tr>
<td>Degree 3</td>
<td>1192–1351</td>
<td>13218–15875</td>
</tr>
<tr>
<td>Not approved</td>
<td>&lt; 1192</td>
<td>&lt;13217</td>
</tr>
</tbody>
</table>


Periodic assessments and evaluations of the quality of care provided by the public and private hospitals are conducted by the MOHME. A standardized checklist is used for assessing quality, and the performance of each hospital is scored according to a rating scale. Most of the indicators are based on inputs (such as presence of certain equipment, a functioning laboratory, and sterilizing units). Process
and output measures have been introduced recently, but their use is not widespread. Every hospital is (in principle) assessed yearly by the MOHME using these checklists and points are awarded accordingly. Although the performance of each hospital is scored, this information is not made public, neither is feedback regularly provided to the hospital.

There are essentially two types of assessments conducted:

- **Impromptu Assessments**: As the name implies, the hospital is not informed prior to the assessment. The evaluators visit the hospital unannounced and the evaluation is conducted using the same instrument/checklist.

- **Routine Hospital Evaluations**: These are conducted annually and the dates are established in advance and communicated to the hospitals. Several parameters are evaluated and include: patient satisfaction and perceptions of quality of services (usually assessed through surveys and exit interviews with patients); equipment (availability, expiration, and functionality); staff training and qualifications; medication safety and availability; and, sanitary and aseptic practices and infection control measures.

Participation in the accreditation process by hospitals is a prerequisite for insurance reimbursement. The accreditation body is a department in the MOHME, but discussions suggest that it is not always adequately financed. Several hundred hospitals participate in the program.\(^\text{21}\)

**Sanctions/Incentives**

The results of these evaluations are linked to certain incentives or disincentives. If a flaw or deficiency is discovered in the course of the assessment, the hospital is usually given some time to rectify the problem. The score allocated to a hospital is supposedly linked to the per diem payment a hospital receives. This per diem payment is set by the High Council for Medical Insurance. However, it is unclear how the specific scores of the hospital are linked to the per diem, or how the calculation is made.

Sanctions that can be meted out include the closure of wards or units in cases of severe violations. Enforcement of this sanction has been difficult; for instance, there have been no reported hospital closures to date, as this is politically difficult to enforce. Anecdotally, there appears to be a tendency for leniency on the part of regulators who are from the MOHME. There is the perception that the hospitals, in the first place, do not receive sufficient funding and a low score (and the resulting penalty of a reduction in per diem funds) would only lead to a worsening of the situation. In addition, most of the public hospitals are under the jurisdiction or ownership of the MOHME; hence, there is a conflict of interest. It appears that there are no severe sanctions, except in the event of severe violations, which might result in the closure of a ward or section of the hospital.

Similar accreditation processes apply to laboratories and diagnostic service providers. Laboratory proficiency tests are conducted, but not for testing the proficiency of specific lab specialists or technicians, but for the lab as an entity. Therefore, it is difficult to determine if the quality of the tests carried out-of-pocket by the lab is optimal, since it is unclear if all staff are proficient in testing. If any deficiency is observed, the person(s) involved is/are recommended for more training.

\(^{21}\) To date, exact numbers reported have not been found reliable.
Quality of Services and Responsiveness to Patients

One of the three main goals of a health system using the World Health Organization 2000 framework (WHO 2000) is responsiveness to the legitimate expectations of the population, mostly for non-health—improving aspects of their interaction with the system. In the framework proposed by Murray and Frenk (2000), seven important subcomponents of health system goals were highlighted, derived mainly from two principles of ethical treatment (a normative approach with roots from respect for human rights) and client orientation (mostly related to patient satisfaction.). These subcomponents include:

- Respect for patient dignity;
- Respect for patient autonomy;
- Confidentiality;
- Prompt attention;
- Basic amenities and work environment;
- Access to social networks; and,
- Choice.

The Health Service Utilization Survey in IR Iran assessed six of these parameters from among the respondents receiving outpatient services and all seven parameters were assessed among the respondents receiving inpatient service. From the survey, it was observed that the average waiting time for seeing a specialist (i.e., from time of referral to time of visit) in the private sector was about nine days. At the health facility, the average waiting time for seeing a provider from the time of arrival was 69 minutes for a specialist and 27 minutes for a GP. The average service delivery time was 28 minutes for a specialist and 11 minutes for a GP. An assessment of the perception of services provided, measured using certain indices of quality of care, revealed an above average level of satisfaction with the services, as illustrated in Figures 5-28 and 5-29.

Figure 5-28: Patient Responsiveness to Outpatient Services (%)

![Graph showing patient responsiveness to outpatient services](source: MOHME (2002)).
No other data on patient satisfaction or quality of care was available that had been routinely and systematically collected in IR Iran. It is, however, not known that any such information collected on the quality of hospital services is routinely applied to decision making by facility managers, neither is it linked to any payment or other incentive structure.

Another survey of medical university hospitals was done by the MOHME, assessing the performance of the hospitals across several quality indices, as illustrated in Table 5-6.

<table>
<thead>
<tr>
<th>Provincial Level General Hospitals</th>
<th>Average Waiting Time in ER (Secs)</th>
<th>Average Waiting Time in ER (Secs)</th>
<th>Average Time Accessing Nursing Care (Secs)</th>
<th>Average Time Accessing Nursing Care (Secs)</th>
<th>Nosocomial Infection Rate (%)</th>
<th>Nosocomial Infection Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>189</td>
<td>189</td>
<td>309</td>
<td>309</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Public (teaching)</td>
<td>360</td>
<td>413</td>
<td>524</td>
<td>401</td>
<td>14.2</td>
<td>10.6</td>
</tr>
<tr>
<td>Public (nonteaching)</td>
<td>298</td>
<td>233</td>
<td>233</td>
<td>401</td>
<td>2.6</td>
<td>10.6</td>
</tr>
</tbody>
</table>


The waiting time in the ER in private general hospitals is about half that of the public general hospitals. The average time to access nurses is also much less in the private hospitals than in the public general hospitals. Within the public general hospitals, a distinction between teaching and nonteaching hospitals can be made. Average waiting time in the ER and for access to nursing care is much shorter in the nonteaching hospitals. The observed differences might be due to a higher patient load in the teaching facilities, because of perceptions of better quality of clinical care due to presence of more specialists, but more data is required to ascertain the reason for the differences.

The nosocomial infection rate is lower in the private general hospitals than in the public hospitals, although further disaggregating shows similar rates between the private and the public nonteaching facilities.
A review of the data showed that of the 41 medical universities, only 12 responded to the data request. Selection bias must be considered and perhaps these are the only institutions collecting this information. The universities reporting were Ghazvin, Golestan, Ilam, Iran, Kermanshah, Kordestan, Markazi, Semnan, Tehran, Urmia, Yasuj, and Zanjan.

**Conclusions and Recommendations**

The Islamic Republic of Iran has a decentralized health system, with authority concentrated at the provincial level. This system has worked well in integrating medical education with health service provision. In addition, under the current structure, primary health care has been decentralized further to the district level. Section 4 noted this has worked well, particularly in rural areas, but not in urban areas. As a result, most people bypass the urban health posts that were established to provide primary care services to the urban population. One reason may be lack of responsiveness to the changing demands of the urban population. Higher expectations of services push patients directly to the district hospital for services or avoid the public system altogether. The private sector accounts for the majority of outpatient care in IR Iran.

Thus, the challenge is that, on the one hand, urban health centers are underutilized and by passed. On the other hand, individuals are utilizing: (i) higher levels of care for primary care conditions; and (ii) higher levels of private sector services that are more expensive and not very well regulated.

Related, utilization survey data has shown that the average waiting time to see a specialist was much higher than that of a GP. This might be due to a high demand for specialist services. It is unclear, however, if the demand for specialist care is appropriate, i.e., if specialists are seen for complex cases that require specialist care, or if many cases could be managed by general practitioners or family medicine practitioners.

Data from the hospital sector do not present a consistent picture as to utilization flows. Admissions and average lengths of stay appear low, the bed occupancy rate is low, yet the numbers of beds are increasing fairly rapidly. Bed occupancy rates vary significantly by province. More analytic work is needed to understand the hospital sector. The work to date is especially hampered by a limited profile of the private sector. Public sector facilities do not appear to have the flexibility needed to innovate and manage care efficiently. The government has piloted several projects to improve management and the quality of services, but results have been mixed.

The regulatory and quality assurance and quality improvement functions need to be strengthened. Clear guidelines need to be established for making explicit the sanctions/incentives for compliance with quality standards. This is in-line with Article 89 of the Fourth Five-Year Plan.
Box 5-2: Tunisia: Quality Improvement, A Practical Approach

A practical approach utilized in Tunisia for creating a Quality Improvement (QI) culture in the delivery system at the national level:

- Identify QI priority interventions with performance indicators related to the top 5-20 causes of health problems with particular focus on: (i) patient satisfaction and safety, (ii) managing chronic illnesses, and (iii) preventing medical complications and errors.
- The objectives of these QI interventions should be clear, feasible, and resolvable within a short period of time (e.g., one year) and measurable over time, and have its systemic root causes well identified and the change bundle evidence-based.
- The process redesign for these QI interventions should also ensure the efficient use of resources.
- The participation in implementing these QI interventions should be “voluntary” and each intervention should be adopted by a number of collaborating hospitals/facilities to exchange information, review progress by peers, and cross fertilize their experiences — “the QI collaborative model.”
- Role of the central/provincial level will be to provide guidance, support, motivation, and the necessary resources to implement these initiatives.

At the same time, the recent trend in quality is to move toward voluntary and collaborative team work within facilities, focusing on process analysis, efficient outputs, and improved outcomes (Box 5-2). This “quality improvement” approach might be piloted in one or more sites in the short term.

Short-Term Recommendations (One to Two Years)

1) Thoroughly Review and Evaluate the Impact of Contracting Pilots, including the use of cooperatives and other forms of autonomization pilots. Lessons may be very useful in determining the best way forward. The objectives of such reforms are to improve health systems performance in terms of efficiency (technical and allocative), as well as the organizational effectiveness of these facilities. Equity and financial risk protection are better served by other instruments such as financing reforms, and these should be complementary to any changes. Working closely with the community, policy makers, and other major stakeholders is important for the success of such reforms.

2) Develop Incentives or Regulations to Encourage Patients to Seek Care at the Primary Care Level, and discourage patients from skipping levels of services to go directly to specialist care services. A number of incentives and options are discussed in Section 5, and Section 6 reinforces the importance of considering options to change patient flows, both short and medium term. These could be positive incentives to see the GP (lower co-pays or better coverage of pharmaceuticals) or negative incentives if they skip this primary care level (higher out-of-pocket costs). Another approach would be to allow specialists visits only when referred, in contrast with the current system where specialists receive walk-ins.

3) Cap the Number of Hospital Beds. Overall, only 82 percent of beds in IR Iran’s hospitals are active, and bed occupancy rate is quite low. This wastes resources on utility costs, staffing and salaries, and maintenance. It might be cost-effective to cap or severely limit further expansion of hospital beds unless warranted by increased demand. Regional planning councils could oversee this process and
develop guidelines for bed expansion. Older infrastructure could continue to be replaced, but no expansion of overall numbers of beds would occur.

At the same time more beds can be re-allocated from wards with low utilization to others with very high demand, and new wards created to accommodate the needs of patients with the most frequently seen diagnoses.

4) **Create a new Medical Technology Assessment (MTA) Council and Process.** The use of MTA has been used in Europe, particularly the Netherlands and Sweden, to rationalize the installation and use of high technology and high end procedures. The MTA process uses a synthesis of evidence on safety, effectiveness, cost-effectiveness, and legal and social impact issues to better manage and allocate drugs, devices, and procedures. The use of MTA findings can be integrated with changes in coverage, the benefits package, and updates of tariffs for services for MOHME and the social insurance organizations.

This same rational use of resources argument for hospitals and beds applies to health technologies such as CT scans and MRIs. Available data shows an excess supply of MRI facilities. The MRI per capita in IR Iran is higher than that of countries of comparable per capita GDP. This may be leading to induced demand for unnecessary services and unnecessarily driving up health care costs. A system for regulating the amount of expensive medical technologies should be developed for better assuring rational and appropriate use, across both public and private sectors.

If the trend in health technology parallels trends in privatization of pharmacies, laboratories, and radiology centers, the public sector may want to consider divesting in these areas and instead focus resources on its stewardship function to ensure effective regulation, health technology assessment, and rational utilization of such services, rather than increase the supply of services.

5) **Establish an Independent or Autonomous Regulatory and Accreditation Organization** with the mandate to enforce quality and performance regulations set forth by the MOHME. An accreditation unit within the MOHME, which is in charge of most of the public hospitals and also for granting licenses, might not be the appropriate body to assess the performance of hospitals, since there appears to be a conflict of interest. Financing of such an independent regulatory body should be adequate and, if possible, independent of the MOHME’s ability to facilitate the provision of unbiased feedback.

6) **Restructure Hospital Performance Evaluation** to be more outcome- and process-oriented. Outcome and process indicators should be emphasized and integrated with the current evaluation process, which is heavily input-focused. Tailoring the accreditation process to the provider setting (such as designing specific processes for ambulatory care, inpatient services, and nursing homes), and the use of specific targets should be encouraged. For instance, monitoring specific disease management protocols, like diabetes and cardiovascular disease management, would be useful in the light of the growing chronic disease burden.

7) **Introduce Efficiency Indices as Part of the Accreditation Process**, adding financial incentives for reaching certain benchmarks. It is important to link evaluation results to certain incentives, including financial rewards. This will encourage providers to become more focused on target areas of improvement and will help achieve sustained behavior change. However, this will require a system of adequate monitoring to assure quality is not being compromised.

In addition, appropriate feedback should be provided to the hospitals and publication of accreditation results should be considered, enabling patients to make more informed decisions on quality. There is
a need for more routine and systematic assessment of various indices of quality of care, including patient satisfaction with services provided.

8) **Make the Results of the Accreditation Process Public.** Some countries rank hospitals according to accreditation score and publish the league table in a public newspaper (e.g., Egypt and the United States). This could be introduced initially on a voluntary basis, where hospitals allow their ratings to be made public. Information will enable patients make better informed decisions on quality, and will build public confidence in the quality and safety of care that is provided by the accredited facilities.

9) **Encourage Impromptu and Unannounced Evaluations** of various indices of quality of care, including patient satisfaction with services. This will foster a state of continuous accreditation readiness in health facilities and avoid a situation whereby facilities only strive to improve quality only around the announced dates of evaluation. Introducing internal quality improvement teams and patient safety programs within facilities will foster this and should be encouraged.

**Medium-Term Recommendations (Three to Five Years)**

1) **Encourage and Develop Alternative Models of Cost-Effective Services.** Other models of health care delivery should be encouraged, such as ambulatory care same, day surgeries, and other types of outpatient-based care, transitional care facilities, stand alone hospice facilities, lower cost nursing homes, and increasing adoption of community or home-based management where appropriate. These can be alternatives to more expensive hospital-based care while maintaining or improving the level of quality.

   In order for this to be effective, the introduction of a system of general practitioners and family physicians may be necessary (Section 5) to manage the entire continuum of care for patients, especially those with chronic conditions.

2) **Encourage Organizational Reform and Increased Hospital Autonomy.** Organizational reforms in IR Iran’s public hospitals are an important issue for the near- and medium-term. In the short term, evaluate current pilots, and design a new phase of pilots based on lessons learned. In the medium term, develop national policies implementing some level of autonomization.

   Global evidence shows that successful cases of organizational reform have had a uniform approach to autonomization across the five parameters of hospital autonomy. In addition, there are other external factors important for successful reform, such as competent leadership, a strong legal framework, adequate funding for hospitals during the reform process, stakeholder involvement, and political consensus. Reforms may be introduced rapidly, particularly if there is overwhelming political will such as in times of party majority or fiscal stress. The downside is that organizational reform may quickly run into difficulty, requiring repeated amendments along the way. On the other hand, reforms may be introduced slowly to avoid such pitfalls, but may fail to deliver in a timely manner, therefore lead to waning support for the reform process. Therefore, “when” and “how” to introduce such reforms will depend on the policy maker’s ability to take into account the political economy of the reform.

   Two approaches to reform design have been observed from successful programs (Table 5-7):

   a) A more radical market-oriented approach as seen in Singapore and Malaysia. In this approach, the organizational reforms were preceded or accompanied by reforms in payment systems to create incentives for productivity.
b) An incremental management reform approach as seen in Tunisia and Hong Kong, where the focus was on improving the management of hospitals rather than changing the market environment.

In some of the less successful cases such as in New Zealand, there were issues with consistency of approach and ambivalence toward market-oriented reforms. For example, the New Zealand case lies at the “autonomous” end of the spectrum except for the dimension of “residual claimant status.” Hospital managers were given freedoms without adequate incentives for efficiency. There was no incentive for managers to reduce costs since the extra revenue generated would not be retained. Conversely, the Indonesian case lies at the “budget agency” end of the spectrum except for “residual claimant status.” Managers were given incentives to increase private earnings without freedom to reallocate earnings to optimize their input mix. In addition, there were no incentives to ensure efficiency and equity through accountability or market mechanisms.

**Table 5-7: Organizational Reforms: International Experience**

<table>
<thead>
<tr>
<th></th>
<th>Budgetary Unit</th>
<th>Autonomized Unit</th>
<th>Corporatized Unit</th>
<th>Privatized Unit</th>
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</thead>
<tbody>
<tr>
<td>Decision rights</td>
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<td>Tunisia</td>
<td>New Zealand</td>
<td>Singapore</td>
</tr>
<tr>
<td></td>
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<td>Market exposure</td>
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<td>Social functions</td>
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<td>Australia</td>
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*Source: Preker and Harding 2002.*
Section 6
Health Financing, Pooling, and Purchasing

Overview

Health financing and resource allocation for services are critical dimensions of health policy in all countries of the world. Revenues for services need to integrate and interact with tax policy and with broader macroeconomic and fiscal goals. Pooling and management of funds is a common theme in health financing, as it is directly linked to one of the principal goals of health financing reform (and indeed, of health systems more generally): improving protection against the financial risk of using health care services. Experience with reforms in other countries suggests that there are two aspects: (a) pooling as a policy objective (i.e., risk pooling), and (b) pooling as a policy instrument (i.e., changes in the way that funds are accumulated in the health system). Finally, resource allocation and purchasing decisions relate to policy decisions regarding both equity and efficiency such as who is covered, what services are covered, who can deliver services, and the incentive structure underlying the payment for services rendered.

Box 6-1: Summary Points

The Islamic Republic of Iran has made enormous progress over the last several years in extending insurance coverage to almost all of its population. The country enjoys increasingly sophisticated health insurance organizations to manage and purchase services on behalf of their enrollees. The rural health insurance program is the latest milestone in this progress since the revolution.

The recent trends in expenditures suggest IR Iran is in a period of significant expansion of funding for health care; expenditures appear to be growing at a rapid pace.

Funding for health is highly regressive and inequitable with large out-of-pocket payments (OOPs), and is highly regressive and inequitable under the SSO and the MSIO program. For the new rural insurance program, rich and poor alike pay no premium, raising questions about a poorly targeted contribution structure. In the SSO, the payroll tax is excessive by international comparisons.

There is little or no regulation on health financing in the private sector. Service tariff regulations are generally ignored. Nor is there governance to coordinate across public and private sectors for either financing or coordination of financing and provision.

In terms of pooling, health financing remains fragmented and contributes to inequities and inefficiencies in the allocation and use of resources, increasing administrative costs, and leading to duplication of coverage and services.

There is growing evidence that the health funds are not well targeted, nor well spent, raising issues of both macro- and micro-level efficiency and equity. The public budgets of the Ministry of Health and Medical Education are inequitably allocated. Provider payment systems are both complicated and providing the wrong sets of incentives. High formal and informal payments by consumers affect all income groups but may be hurting access and quality for lower income groups.

Based on the WHO definition, the purpose of health sector financing is to generate sufficient funds to motivate health care providers in a manner that would ensure society’s access to individual and public health care and medical services (WHR 2000). The success of the financing process depends upon the
performance of these three important functions: revenue collection, pooling of resources, and purchasing of services and interventions.

Health sector financing in the Islamic Republic of Iran (IR Iran) is characterized by a pluralistic approach to sources of revenues, management and pooling of resources, and in the use of funds for purchasing and provision of services. This section provides an overview of expenditures, both public and private, and looks at patterns over time.

Section 6 then follows the schematic in Figure 6-1. It discusses the current system in terms sources of financing (revenues), pooling and management, and resource allocation. For each of the three functions of financing, strengths and weaknesses are assessed, and opportunities for restructuring are reviewed. International “best practice” models are provided as examples of what policy makers may consider for future paths. In this section there is, furthermore, a discussion of governance and regulatory arrangements in place in the current financing system.

An examination of the current financing system suggests opportunities exist to raise more revenues through public channels, improve pooling, and allocate resources more effectively. The section ends with conclusions and recommendations for consideration of changes in health financing in IR Iran.

Figure 6-1: Flow of Funds and Functions for Health Financing

Trends and Current Patterns in Health Expenditures

According to the latest health accounts available from WHO (2007), IR Iran in 2005 spent USD 788 (PPP) per capita on health, USD 414 (PPP) came from public or publicly-sponsored insurance. This was 7.8 percent of the gross domestic product (GDP).

The long-term trend of government commitment to health and its allocation to public expenditures has been generally positive, as shown in Figure 6-2. Under the Third Five-Year Plan, the Ministry of Health and Medical Education (MOHME) was tasked with expanding health centers. Governments in any country show different levels of commitment to public expenditures on health as a share of public expenditures available. In IR Iran, the share of the sector’s recurrent expenditures in the government rose from 3.2 percent in 1971 to 5 percent in 2001. At the same time, the share of expenditures has generally fallen over the last decade from a historic high of over 9 percent in 1995.
Figure 6-2: Ratio of Government Recurrent Expenditures on Health To Total Recurrent Government Expenditures

Source: Kermani 2004.

Figure 6-3 shows the more recent trend of government expenditure on health as a share of total government expenditures. It shows a general upward trend in this decade, and has increased from under 10 percent in 2002 to slightly less than 14 percent in 2005.

Figure 6-3: General Government Expenditure on Health as a Percentage Of General Government Expenditure

Source: WHO National Health Accounts, last updated February 1, 2007 (http://www.who.int/nha/country/irm/en/).

Figure 6-4 shows the long-term trends in expenditures for public, private, and total. Overall expenditures in real per capita terms peaked in the early 1980s, dropped for the next decade, then peaked again in the early 1990s, only to drop again in the mid and late 1990s. Public expenditures in real terms grew significantly in the 1970s but have leveled off and dropped since the 1980s into the late 1990s. The drop in growth in new public sector expenditures in the 1980s and 1990s appears to have been largely offset by sustained private expenditures.
Table 6-1 and Figure 6-5 present a closer look at both public and private spending over the more recent period of the last decade and a half. Each shows an upturn in the current decade of both government expenditures and private expenditures. The upturn in private expenditures is especially pronounced, and it is rising at a much higher rate than public expenditures.

Table 6-1: Recurrent Health Expenditure in the Government Budget and Household Expenditures

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<tr>
<td>Recurrent Government Expenditure on Health</td>
<td>160</td>
<td>39</td>
<td>383</td>
<td>49</td>
<td>382</td>
<td>27</td>
<td>445</td>
<td>32</td>
</tr>
<tr>
<td>Recurrent Government Expenditure from Social Insurance</td>
<td>101</td>
<td>25</td>
<td>141</td>
<td>18</td>
<td>138</td>
<td>10</td>
<td>195</td>
<td>14</td>
</tr>
<tr>
<td>Households</td>
<td>98</td>
<td>24</td>
<td>195</td>
<td>25</td>
<td>831</td>
<td>60</td>
<td>691</td>
<td>49</td>
</tr>
<tr>
<td>Others</td>
<td>48</td>
<td>12</td>
<td>64</td>
<td>8</td>
<td>47</td>
<td>3</td>
<td>72</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>407</td>
<td>100</td>
<td>783</td>
<td>100</td>
<td>1,398</td>
<td>100</td>
<td>1,403</td>
<td>100</td>
</tr>
</tbody>
</table>


Note: Data on 2001 onward were adjusted with Consumer Price Index (1990=100.)
**Figure 6-5: Figure: Per Capita Expenditures on Health: Household And Government**

(Rials in Constant 1990 Prices)

**Sources:** Household Expenditure on Health from 1989 to 1998: The MOHME, Islamic Republic of Iran National Health Accounts “Second Attempt”, presentation at the third regional National Health Accounts Workshop, May 2000; Household Expenditure on Health for 2001: Statistical Center of Iran, National Health Accounts 2001; Household Expenditure on Health for 2003 and 2004: World Bank staff estimates derived from Statistical Center of Iran’s estimates of the number of household in 2003 and 2004 (urban and rural households), and Household Budget Surveys 2003 and 2004 (average household expenditure on health by urban and rural); Government Expenditure on Health: Between 1989 and 1998, MOHME, Islamic Republic of Iran National Health Accounts “Second Attempt”, the presentation at the third regional National Health Accounts Workshop, May 2000; for Government Expenditure on Health in 2001, Statistical Center of Iran, National Health Accounts 2001; Government Expenditure on Health for 2003 was a World Bank staff estimate derived from the Government Budget Law for Social Sector and the Social Security and Social Insurance Budget provided by Office of Financing Resource Designing and Budget, the MOHME, using an assumption that the ratio between the MOHME’s budget and other public institutions’ budget (e.g., SSO’s expenditure financed by premium, state-owned firms expenditure financed by employees compensation) was 60:40, which was observed the available data from 1998 to 2001; inflation adjustment used the Medical Care Price Index between 1989 and 2000, Central Bank of Iran (national average), between 2001 and 2004, a proxy Medical Care Price Index was derived from data in Statistical Center of Iran, Statistical Year book, 1376 & 1383. For 2001, urban medical price index was used; for 2003 and 2004, the national average medical care price index was estimated from the number of households and medical care price indices by urban and rural. Government expenditure on health in 2003 was adjusted by the above national average medical care price index, with an assumption that the ratio of government expenditure on health between urban and rural is 85:15. Population Estimates: World Bank’s World Development Indicators 2006.
These numbers appear consistent with trends reported by WHO over the last decade in both international dollars and at the currency exchange rates (Figure 6-6).

Figure 6-6: Per Capita Health Expenditure (Total and Government Only)

![Graph: Per Capita Health Expenditure](https://example.com/graph66.png)

Source: WHO National Health Accounts, last updated February 1, 2007 (http://www.who.int/nha/country/irn/en/).

Similarly, health expenditures as a share of GDP have also been climbing, even as GDP growth was robust during this period (see Section 2). Figure 2-2 shows GDP growth over the last decade; Figure 6-7 shows health expenditures as a share of GDP over the last decade.

Figure 6-7: Total Health Expenditures as Percentage of GDP

![Graph: Health Expenditures as Percentage of GDP](https://example.com/graph67.png)

Source: WHO National Health Accounts, last updated February 1, 2007 (http://www.who.int/nha/country/irn/en/).

Overall, health expenditures for health care are higher relative to other countries in the world, in terms of expenditures per capita given the relative level of GDP per capita (Figure 6-8), though similar in terms of government levels of spending (Figures 6-8 and 6-9). However, IR Iran is a relatively big spender compared to its neighbors in the region (Figure 6-10). The country appears to do less well in terms of
funding through public channels, with less than half of all revenues from public channels, and relies to a greater degree on out-of-pocket payments from consumers (Figure 6-11), raising initial questions about relative efficiency and equity, as well as issues of financial protection for the poor.

**Figures 6-8 and 6-9: Global Trend Analysis of Total Health Expenditure (2004)**

![Graph](image_url)

Source: WDI (2007).

**Figure 6-10: Health Expenditure as Share of GDP Middle East and North Africa Region (2004)**

![Bar Chart](image_url)


Note: Tunisia’s total health expenditure as share of GDP is from 2003, World Bank (Tunisia Health Sector Strategy).
Figure 6-11: Government Expenditure on Health as Share (%) of Total Health Expenditure (2004)

Note: Tunisia’s total health expenditure as share of GDP is from 2003, World Bank, Tunisia HSR.

Sources and Uses of Funds, and Changes over Time

The Islamic Republic of Iran currently has finished two different exercises of national health accounts, for the years 1997/1998 and 2001; and these results provide a more detailed snapshot of two distinct points in time in terms of the funds flow through the health care system.

Tables 6-2 and 6-3 show the matrices of sources and uses of expenditures for the latest available years, 1998 and 2001. Unfortunately, the matrices are not comparable. The matrix for year 2005 is not available to date but is being updated by the Iranian MOHME Health Reform Unit as of this draft.

Table 6-2: National Health Expenditure Matrix Fund as Percentage of Total (1998)

<table>
<thead>
<tr>
<th>Fund</th>
<th>MOHME</th>
<th>SSO</th>
<th>MSIO</th>
<th>IKRC</th>
<th>Insurance Co.</th>
<th>Banks</th>
<th>Oil Co.</th>
<th>Radio &amp; TV</th>
<th>Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Practitioners</td>
<td>0</td>
<td>5.4</td>
<td>4.4</td>
<td>6.2</td>
<td>0</td>
<td>4.5</td>
<td>0</td>
<td>0</td>
<td>0.6</td>
</tr>
<tr>
<td>Specialists</td>
<td>0</td>
<td>5.3</td>
<td>0</td>
<td>1.9</td>
<td>0</td>
<td>9.1</td>
<td>0</td>
<td>0</td>
<td>0.7</td>
</tr>
<tr>
<td>X-Rays</td>
<td>0</td>
<td>2.4</td>
<td>3.2</td>
<td>1.6</td>
<td>0</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Prescription</td>
<td>0</td>
<td>6.5</td>
<td>5.1</td>
<td>1.9</td>
<td>0</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>4.8</td>
</tr>
<tr>
<td>Laboratory</td>
<td>6.7</td>
<td>15.8</td>
<td>15.5</td>
<td>8.3</td>
<td>0</td>
<td>7.4</td>
<td>0</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>Dentistry</td>
<td>0</td>
<td>0.3</td>
<td>0.6</td>
<td>0</td>
<td>0</td>
<td>10.3</td>
<td>0</td>
<td>0</td>
<td>13.5</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>0</td>
<td>0.1</td>
<td>0.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.7</td>
</tr>
<tr>
<td>Direct Payment to Households</td>
<td>0</td>
<td>3.5</td>
<td>2.6</td>
<td>1.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.6</td>
</tr>
<tr>
<td>Public Hospital Inpatient</td>
<td>23.1</td>
<td>34.2</td>
<td>33.4</td>
<td>36</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.4</td>
</tr>
<tr>
<td>Public Hospital Outpatient</td>
<td>0.9</td>
<td>2.5</td>
<td>6.4</td>
<td>4.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.6</td>
</tr>
<tr>
<td>Private Hospital Inpatient</td>
<td>0</td>
<td>3.8</td>
<td>4.9</td>
<td>4.5</td>
<td>100</td>
<td>39.3</td>
<td>0</td>
<td>0</td>
<td>29.4</td>
</tr>
<tr>
<td>Private Hospital Outpatient</td>
<td>0</td>
<td>0.3</td>
<td>0.4</td>
<td>0.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.6</td>
</tr>
<tr>
<td>Primary Health Care</td>
<td>25</td>
<td>0</td>
<td>0</td>
<td>0.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5.7</td>
</tr>
<tr>
<td>Administrative Costs</td>
<td>5</td>
<td>2.8</td>
<td>5.1</td>
<td>2.6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.9</td>
</tr>
<tr>
<td>Development Costs</td>
<td>15</td>
<td>11.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.4</td>
</tr>
<tr>
<td>Medical equipments</td>
<td>0</td>
<td>5.1</td>
<td>0</td>
<td>1.2</td>
<td>0</td>
<td>5.5</td>
<td>0</td>
<td>0</td>
<td>5.2</td>
</tr>
<tr>
<td>Medical Education</td>
<td>1.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Research and Development</td>
<td>1.4</td>
<td>0</td>
<td>2.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td>Nutrition</td>
<td>6.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.1</td>
</tr>
<tr>
<td>Rehabilitation</td>
<td>1.7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.4</td>
</tr>
<tr>
<td>Other medical services</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.8</td>
</tr>
<tr>
<td>Others</td>
<td>0.5</td>
<td>1.1</td>
<td>2.9</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Adapted from IR Iran National Health Accounts 1998 prepared by Iranian NHA Team.
Table 6-3: National Health Expenditures in Total Rials and Percentages (2001)

<table>
<thead>
<tr>
<th>Source of Funds</th>
<th>Type of Service</th>
<th>Total</th>
<th>Inpatient</th>
<th>Outpatient</th>
<th>Drugs</th>
<th>Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>30,429,791</td>
<td>14,333,525</td>
<td>9,329,364</td>
<td>5,278,141</td>
<td>1,488,761</td>
</tr>
<tr>
<td>MOHME</td>
<td></td>
<td>4,310,812</td>
<td>1,590,973</td>
<td>783,453</td>
<td>693,261</td>
<td>1,243,125</td>
</tr>
<tr>
<td>Other governmental agencies</td>
<td></td>
<td>6,507,281</td>
<td>3,994,041</td>
<td>1,436,287</td>
<td>831,317</td>
<td>245,636</td>
</tr>
<tr>
<td>Household</td>
<td></td>
<td>19,611,698</td>
<td>8,748,511</td>
<td>7,109,624</td>
<td>3,753,563</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Statistical Center of Iran, National Health Accounts 2001
Note: Other government agencies include governmental banks, insurance companies, social security organization, Television network etc.

Table 6-4: Distribution of Health Care Expenditures (1997 and 2001)

<table>
<thead>
<tr>
<th></th>
<th>1998 (%)</th>
<th>2001 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary and tertiary care *</td>
<td>58.0</td>
<td>57.0</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>15.0</td>
<td>n/a</td>
</tr>
<tr>
<td>PHC</td>
<td>7.0</td>
<td>n/a</td>
</tr>
<tr>
<td>Education</td>
<td>4.0</td>
<td>3.3</td>
</tr>
<tr>
<td>Construction</td>
<td>5.0</td>
<td>3.6</td>
</tr>
<tr>
<td>Administration</td>
<td>2.0</td>
<td>n/a</td>
</tr>
<tr>
<td>Research and development (R&amp;D)</td>
<td>1.0</td>
<td>0.4</td>
</tr>
<tr>
<td>Other</td>
<td>8.0</td>
<td>36.7</td>
</tr>
</tbody>
</table>

Note: Includes outpatient specialist care which increases the share relative to the category “inpatient services” in Table 6-3.

Expenditures for primary care in 1997 at 7.0 percent is quite low by international standards, but this number reflects MOHME spending only. (More discussion of primary care and outpatient care expenditures, both currently and over time, are discussed in Section 4 on primary care, and are not repeated here.)
Expenditures for inpatient services (Table 6-3) and secondary and tertiary services (Table 6-4) appear high relative to other countries, especially developed countries. This is consistent with the discussions in Sections 4 and 5. Figure 6-14 shows the relative expenditure mix across OECD countries, from Mexico to Korea. Inpatient services account for less than 40 percent of all expenditures in all cases except Iceland (42 percent) and Italy (44 percent).

**Figure 6-14: Current Expenditures by Medical Services, Medical Goods and Collective Care for OECD Countries (2003)**

*Source: OECD (2006).*

*Note: Countries ranked by total inpatient care as share of current expenditure on health; LTC is long-term care.*
However, definitions may not be exactly comparable between OECD and IR Iran numbers. With IR Iran, “secondary and tertiary services” includes specialist outpatient care. Indeed, the expenditure matrices for 1998 above suggest inpatient expenditures at a more modest 31 percent of overall share of expenditures. This figure, if still a reasonable estimate a decade later, would suggest inpatient shares similar to OECD countries. But, sections 5 and 6 have described a system that is moving to greater reliance on more expensive secondary and tertiary services, consistent with the higher percentages in the 2001 figures.

**Sources of Revenues and Collection of Funds**

Sources of revenues for health in IR Iran are complex. Funds are collected through many (and mostly disconnected) public and private channels. The MOHME receives budget funds for a number of targeted programs including public health, health prevention and promotion, medical education, research, training, rural primary care programs, and special programs of social priority such as organ transplant programs. Recent budget figures are presented in Figure 6-15.

**Figure 6-15: MOHME’s Budget Allocated to Medical University (2006)**

Curative care is covered through three types of health insurance organizations: public, private, and government organization-based such as National Iranian Oil Company. The four public social health insurance organizations comprise an estimated 89 percent of insurance resources; the other types roughly split the remainder (Kermani 2004). The two main public social insurance organizations are the Social Security Organization (SSO) for the formal employment sector, and the Medical Services Insurance Organization (MSIO).

The Medical Service Insurance Organization (MSIO) is the largest, but it is in fact an umbrella organization that includes several smaller and independent pools of insurance, such as the funds for civil servants, for students, the new rural health insurance program established in 1996, and a voluntary program for the self-employed. The MSIO covers an estimated 39.1 million people, or over 57 percent of the population, in 2007 (MOSW 2007). The Social Security Organization (SSO) covers 6.3 million workers and nearly 27 million of their dependents (about 39 percent of the population). The Armed Forces Medical Services Insurance Organization (AFMSO) provides coverage for servicemen and families (estimated three to four million population). The Imam Khomeini Foundation (IKF) provides
coverage for the poor. Table 6-5 provides a breakdown of numbers of people covered in each insurance organization and other organizations, and over the time period 1997–2004.

<table>
<thead>
<tr>
<th>Category</th>
<th>1997</th>
<th>1998</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population of Country</td>
<td>60,936,457</td>
<td>61,835,000</td>
<td>67,005,952</td>
</tr>
<tr>
<td>Medical Service Insurance Organization</td>
<td>26,855,014</td>
<td>27,923,704</td>
<td>32,588,797</td>
</tr>
<tr>
<td>Government employee fund</td>
<td>6,017,730</td>
<td>6,160,184</td>
<td>6,915,678</td>
</tr>
<tr>
<td>Rural health insurance</td>
<td>18,930,779</td>
<td>20,304,480</td>
<td>23,419,936</td>
</tr>
<tr>
<td>Self-employed fund</td>
<td>1,167,457</td>
<td>676,408</td>
<td>399,805</td>
</tr>
<tr>
<td>Other funds</td>
<td>739,048</td>
<td>782,627</td>
<td>1,553,378</td>
</tr>
<tr>
<td>Social Security Organization</td>
<td>23,085,944</td>
<td>24,204,177</td>
<td>26,089,397</td>
</tr>
<tr>
<td>Imam Khomeini</td>
<td>4,059,936</td>
<td>4,621,740</td>
<td>5,200,000</td>
</tr>
<tr>
<td>Armed Forces</td>
<td>n/a</td>
<td>n/a</td>
<td>3,600,000</td>
</tr>
<tr>
<td>Ministry of Oil</td>
<td>550,000</td>
<td>605,000</td>
<td>n/a</td>
</tr>
<tr>
<td>Banking System</td>
<td>600,000</td>
<td>605,000</td>
<td>n/a</td>
</tr>
<tr>
<td>Radio and Television Network</td>
<td>68,000</td>
<td>78,000</td>
<td>n/a</td>
</tr>
<tr>
<td>Others</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Total Covered</strong></td>
<td>55,150,894</td>
<td>58,004,621</td>
<td>67,005,952</td>
</tr>
</tbody>
</table>

Source: Data in 1997 and 1998 are from MOHME (2000); data in 2004 collected by the National Health Sector Reform Unit, the MOHME and from Statistical Center of Iran Statistical Yearbook 1383, Table “Beneficiaries (Principals and Dependents) of Medical Services Covered by Medical Services Insurance Organization” from Kermani’s (2004). Estimated numbers for 2004 from Fazaeli (2006).

There are, furthermore, public and private insurance schemes to cover some portion or all services, and are sometimes associated with employers in groupings of state (Dana, Aborz, and OPrIP for civil servants), or private enterprises (Bank Melli Iran, Bank Sedaret, and the airlines), as well as parastatal and public closed “parallel” ministry systems such as the State Telecommunications Organization and the Oil Ministry. Private insurance is estimated to cover less than one million citizens. Finally, there are a number of separate schemes for privileged groups such as the Parliament, local councils, and the Supreme Council. All of these separate organizations and schema have developed in an evolutionary fashion over time, with little coordination by the government.

Collection of funds for the SSO is through a payroll tax of 30 percent and covers health (9 percent), pensions (18 percent), and unemployment (3 percent). Payment comes from the employer (20 percent) and employee (10 percent). There is a floor and cap on the payroll tax of Rls 1.2 million and Rls 6.4 million per month. The floor is set by the minimum wage; the cap is set by its board or High Council and is usually set at around five to six times the minimum wage.

The MSIO programs, on the other hand, collect flat premiums of around Rls 35,000 per month. The level is the same regardless of income or assets. The exception is the new rural health insurance program, which is entirely funded through general revenues; there is no contribution from enrollees. The financing method for MSIO groups is provided in Table 6-6.
Table 6-6: Financing Method for Enrollee Groups in MSIO (2003)

<table>
<thead>
<tr>
<th>Group</th>
<th>Financing Method</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government employees</td>
<td>Per Capita, Rls 200,000&lt;br&gt;70% Government/30% Employee</td>
<td>Does not vary by income level</td>
</tr>
<tr>
<td>Rural villagers</td>
<td>Per Capita, Rls 50,000</td>
<td>Paid by government</td>
</tr>
<tr>
<td>Poor under social protection coverage</td>
<td>Per Capita, Rls 120,000</td>
<td>Paid by government</td>
</tr>
<tr>
<td>Self-employed</td>
<td>Per Capita, Rls 250,000</td>
<td>Paid by individuals</td>
</tr>
<tr>
<td>Poor self-employees</td>
<td>Per Capita, Rls 66,000</td>
<td>Paid by government</td>
</tr>
<tr>
<td>Others (students, war-injured, etc.)</td>
<td>Per Capita, Rls 200,000</td>
<td>80% paid by government</td>
</tr>
</tbody>
</table>

Source: Monazzam (2005); World Health Organization (2006); and MOHME (2005).

The AFMSO is a per capita contribution with 75 percent coming from the government, and 25 percent coming from the enrollee. The IKF is free to the deserving and is funded through general revenues.

Table 6-7 shows the relative distribution of funds being collected through various financing agents in 1997 and again 2001. The updates for 2005 are in process as of this writing.

Table 6-7: Relative Distribution across Financing Agents over Time (%)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MOHME</td>
<td>27.5</td>
<td>23.6</td>
<td></td>
</tr>
<tr>
<td>SSO</td>
<td>11.9</td>
<td>10.7</td>
<td></td>
</tr>
<tr>
<td>MSIO</td>
<td>5.0</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>IKF</td>
<td>1.5</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Household</td>
<td>51.6</td>
<td>53.6</td>
<td></td>
</tr>
<tr>
<td>Ministry of Oil</td>
<td>1.0</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>Banks</td>
<td>0.6</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Insurance companies</td>
<td>0.7</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Radio and TV network</td>
<td>0.1</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>0.0</td>
<td>8.9</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>


Note: NHA 1998 and NHA 2001 use slightly different categorization. The NHA 2001 matrix did not specify how much of funds were channeled through MSIO or IKF.

A universal health coverage law was passed 10 years ago, but IR Iran still falls short of universal coverage. An estimated 10–25 percent of the population has no coverage, depending upon the source and study. The official government estimate is 10 percent. Anecdotally, there is the further concern of duplicate coverage, with families migrating from rural to urban areas or with a change in employment, individuals and families migrate across insurance programs sometimes retaining coverage for more than one insurer. This complicates a good accounting of coverage gaps.

The majority of revenues, as already noted, come from out-of-pocket payments (OOPs) at the point-of-service. The OOPs are for formal charges for outpatient and inpatient services and for pharmaceuticals
both in the health care delivery system (as a co-payment, with 30 percent co-payment for outpatient services and 10 percent co-payment for inpatient services), and over-the-counter at retail outlets.

The OOPs are both formal and informal. The informal part is estimated by government experts at over 50 percent of all OOPs, and is provided for additional medicines, lab fees, diagnostics, and surgeries. Informal payments are growing as a way to jump the queue or obtain a perceived higher quality of service.

**Impact of Out-of-Pocket Payments on Equity and Financial Protection**

Out-of-pocket payments may affect access to services. The Iran Expenditure and Income Surveys of Households have found that OOPs have been increasing as a share of income over time since 1990.\(^{22}\)

![Figure 6-16: Percentage of Total Household Expenditure on Health by Income Deciles (1990–2005)](image)

*Source: SCI (2008).*

The 2002 utilization survey of 3,500 households found that 29 percent of the families of hospitalized patients incurred “catastrophic costs” of 50 percent or more of income. Twice as many (37 percent) reported this if using private hospitals as SSO hospitals (18 percent). The effect of hospitalization on family income and savings is provided in Figure 6-17.

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\(^{22}\) The “Expenditure and Income Survey of Households” is conducted annually by the Iran Statistical Center. These are nationally representative, stratified surveys. In 2005, approximately 27,000 households — nearly 14,000 rural and nearly 13,000 urban — were surveyed on approximately 600 expenditure items including health care and insurance. All calculations in this report utilize sampling weights.
The Health Care Utilization Study of 2002 found that 18 percent of those who delayed care reported high costs as the reason for not seeking care (WHO 2006).

At the same time, OOPs affect income groups differently. Figure 6-18 shows the impact of OOPs in 2004, by both income decile and by urban and rural. It shows that rural residents are paying a higher percentage of income relative to urban counterparts and that the poorer income groups pay a higher percentage of their income as a general pattern. Fazayeli (2006) in Figure 6-19 found that a higher percentage of lower income households become impoverished due to high health care costs in 2004. It is estimated that OOPs is more than 40 percent of average monthly income for an estimated three percent to four percent of the population every year, raising serious concerns about financial protection and impoverishment of those affected.

Other correlates with catastrophic OOPs costs were rural residency, female head of household, elderly over 66 years of age, and households of five or above. The incidence in rural areas was about double that of urban areas (3.29 percent vs. 1.87 percent) in another study using 2002 data according to Razavi et al. (2004). Only an estimated 35 percent of this group incurring catastrophic expenses report having insurance coverage (MOSW 2006).
The distribution of household financial contribution across households has been summarized using an Index of Fairness of Financial Contribution (IFFC). The index is designed to weight heavily those households that have spent a very large share of their discretionary income on health. The index thus reflects overall inequality in household financial contribution into the health system, but particularly reflects those households facing catastrophic health expenditures. “Catastrophic” is defined as greater than 40 percent of discretionary income. The FFC ranges between 0 and 1; the fairer the health financing system, the closer FFC will be to 1. Results for the IFFC over the past decade are reflected in Table 6-8.
Table 6-8: Index of Fairness in Financial Contribution

<table>
<thead>
<tr>
<th>Year</th>
<th>IFFC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>0.8345</td>
</tr>
<tr>
<td>1996</td>
<td>0.8334</td>
</tr>
<tr>
<td>1997</td>
<td>0.8416</td>
</tr>
<tr>
<td>1998</td>
<td>0.8355</td>
</tr>
<tr>
<td>1999</td>
<td>0.8370</td>
</tr>
<tr>
<td>2000</td>
<td>0.8358</td>
</tr>
<tr>
<td>2001</td>
<td>0.8337</td>
</tr>
<tr>
<td>2002</td>
<td>0.8330</td>
</tr>
<tr>
<td>2004</td>
<td>0.83</td>
</tr>
</tbody>
</table>

*Source: Xu (2005).*

The WHO in its World Health Report 2000 on Health Systems reported the IFFC for 1997 as 0.923, significantly higher than the number above. However, the WHO also ranked countries on the IFFC score and ranked IR Iran 112 of 191, just ahead of Burundi, Jamaica, and Madagascar.

**Discussion: Sources of Financing**

Collection of funds are highly regressive and inequitable with large OOPs. This is also true for the programs offered by the SSO and the MSIO. In the MSIO, the janitor and Chancellor of a university, for example, pay the same contribution monthly in the category of government employees. For the new rural insurance program, rich and poor alike pay no premium, raising questions about poorly targeted contribution structure. But for other MSIO programs, government subsidies are utilized to provide coverage and to better assure equity in access and quality of care for different low-income and unemployed groups.

For the future, the government will need to balance equity considerations with assuring coverage and enrollment under its government employees program and under its new rural insurance program. Good evaluations of the new program could help pinpoint needed next steps.

In SSO, the payroll tax is excessive by international comparisons (Figure 6-20). Further, the tax is on income and not assets, and a cap prevents full recovery of payment for the upper income groups. The tax is so high that the under-reporting of income for tax purposes is widespread. Average income reported is only 1.2 times above minimum wage.

There is a further issue of payroll taxes and the link with formalizing the economy and with longer-term management of macroeconomic growth. High payroll taxes may discourage job formation and capital investment, and drive private sector businesses underground, especially small and medium enterprises.

While the economics literature is mixed, high payroll taxes may distort labor and investment decisions in the formal sector. In the EU, for example, payroll taxes are much lower compared with IR Iran and the average for the EU-15 is less than 10 percent on average, with some countries such as Denmark having no payroll tax at all.

What is clearer (see, for example, Wagstaff 2007) is that high payroll taxes discourage the informal economy from coming into the formal sector and paying into the insurance schemes. In IR Iran, the level of the informal economy is estimated at around 20 percent of GDP (Schneider 2006). Furthermore, unemployment has remained high, at or above 10 percent since 1995. The government may wish to reconsider other options for health revenues, especially as revenues for oil exports increase and as a high percentage of the private sector remains uncovered and without any insurance (see below). General revenues or other types of taxes (e.g., VAT or tobacco tax) might be considered as an alternative to the 9 percent payroll tax for the private sector workers.
Linking payroll contributions to coverage often causes an emergence of uncovered groups even in countries with explicit policy objectives of universal coverage. In Russia, for example, over 20 million people are now without coverage under its universal health insurance program. But many other countries (Figure 6–21) show similar problems with coverage.

In the short term, delinking contributions and coverage may encourage more people in the informal sector to come into one of the established insurance systems. There are good examples of governments using general revenues and revenue subsidies for better assuring universal coverage of its national health insurance program. This extends from rich to poor countries. Two countries at either extreme are Japan and Moldova. In Japan, the government provides general tax revenue subsidies to insurance plans with high ratios of enrollees in the employment sector but with low incomes. It breaks insurance plans into separate tiers of:
• 1st tier composed of mostly large corporations, with no subsidies;

• 2nd tier composed of small and medium enterprises, with subsidies amounting to 14 percent of benefit expenditures on average; and,

• 3rd tier composed of the unemployed and self-employed groups including rural farmers, with averaging 50 percent and up to 80 percent for the poorest groups.

In Moldova, a new national health insurance program was enacted in 2003 that was designed to pool general revenues for the unemployed and informal groups with a new payroll tax for the employed. A new payroll tax was introduced with employers and employees each paying 2 percent of the payroll. But share of health expenditure in the general budget expenditure fell from 12.5 percent in 2002 to 8.5 percent in 2004, with policy makers viewing the payroll tax as a substitute to general revenues. There was then an attempt to shift a greater share of the budget for health. The rate of per capita contributions for HI of nonworking and informal groups in the population was set at the level of per capita contribution for the employees. Government health expenditure (payroll tax and general revenue) has started to increase – 17 percent in constant prices in 2005 and 12.5 percent in 2006 (Shishkin 2006). The government committed to the principle of matching health contributions with the cost of the benefits package.

In the process, the Ministry of Finance in Moldova raised concerns about fiscal sustainability. The rise of average wages and salaries, and expansion of the benefits package, increased nondiscretionary government allocations to health. A reasonable compromise was reached to have the budget contribution be not less than the three-year average of public health expenditure to the general government expenditure ratio. Overall, then, they have developed and implemented a mechanism for funding based on a comprehensive fiscal framework of payroll and budget transfers considered together. The centralization of the health budgeting decision facilitated political decisions on the relative priority of the health sector. The new scheme allows the self-employed to make a flat rate contribution equal to per capita cost of the benefits package. To date only 7.5 percent have actually joined, mostly those with higher needs for health care.

Other countries that depend upon relative shares of general revenues under a social health insurance framework are provided in Figure 6-22.

**Figure 6-22: SHI Systems Globally: Reliance on Direct Contributory Taxes Varies**

![Graph showing reliance on direct contributory taxes varying across countries.](source: World Bank (2007).)
While IR Iran has a tradition and track record of general revenue subsidies to cover categorical groups, the issue of coverage remains for the remaining uninsured and informal parts of the workforce/economy. Subsidizing premiums is one important approach, but there are other approaches as well. These include:

- Charging higher user fees at the point of service;
- Providing an attractive benefits package for high quality services; and
- Implementing a series of administrative measures including:
  - Group membership and enrollment through associations, unions, and cooperatives;
  - Community-based organizations that could manage SHI enrollment;
  - Adding the premium to other taxes or fees; and,
  - Pressure from local government officials.

In a country that places priorities on equity for all, this issue of universal coverage in IR Iran will need to be addressed to bring in the millions of uninsured that remain.

**Pooling and Management of Funds**

Health risks in any nation are highly skewed. On average, approximately 10 percent of the population consume about 60 percent of the total health expenditure. Approximately 30 percent of the population has no expenditure. The example of France is shown in Figure 6-23. Universal social health insurance systems, when implemented well, pool risks from rich to poor, from healthy to sick and from young to old. This can help improve equitable access to health services and can help prevent impoverishment from OOPs payments (Figure 6-24).

![Figure 6-23: Concentration of Total Health Expenditures, France (2001)](https://example.com/f6-23.png)

Currently a series of disconnected funds for pooling public and parastatal resources exists in IR Iran. A partial list can be found in Table 6-9.

<table>
<thead>
<tr>
<th>Public/Government</th>
<th>Trade Groups/Ministry of Finance</th>
<th>Quasi-Private</th>
<th>Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOH</td>
<td>Dana</td>
<td>Atiyee Sazan</td>
<td>Sina</td>
</tr>
<tr>
<td>SSO</td>
<td>Alborz</td>
<td>Hafez</td>
<td>Razi</td>
</tr>
<tr>
<td>MSIO</td>
<td>Iran, Islamic Rep. of Asia</td>
<td>Municipalities</td>
<td>Day</td>
</tr>
<tr>
<td>Armed Forces</td>
<td></td>
<td>Oil Companies</td>
<td>SOS</td>
</tr>
<tr>
<td>Imam Khomeini (IKFC)</td>
<td></td>
<td>Melli Bank</td>
<td>Parsian Bank</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mellat Bank</td>
<td>Eghtesad Novin Bank</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sepah Bank</td>
<td>Saman Bank</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agri-Bank</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tejarat Bank</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Helicopter Company</td>
<td></td>
</tr>
</tbody>
</table>


The table provides evidence that there are pools for the public and private sector and within each sector. Even within the public governmental sector, there is a clear division of relative privilege across the insured groups. For example, the employees of the Majlis have their own insurance scheme. The better-off public schemes are estimated to spend three times per capita relative to public schemes for the residual groups such as the rural population. Some information on per capita spending is provided in Figures 6-25 and 6-26 for 1997 and 2002. This shows clearly higher patterns of spending for Ministry of Oil and parastatal organizations. It further shows clear inequities across public and parastatal insurance organizations in both 1997 (left) and again in 2002 (right). In 1997, per capita spending by Ministry of Oil was more than three times that of the SSO, for example, and more than five times that of the Imam Khomeini Foundation. These figures do not adjust for case mix utilization nor differences in risk across these insurance pools. However, these do provide some markers for further investigation and analysis on resources available across public and parastatal funds.
Figures 6-25 and 6-26: Per Capita Health Care Expenditure by Different Insurance Organizations, Billions Rials (1997 and 2002)


The management of pools is typically beset by debt and bailout by special allocations from the public purse. This is especially the case with the MSIO, which must face variation across time with only smaller risk pools to cope with this variation.23

Discussion: Pooling and Management of Funds

The fragmentation of funds is both inequitable and inefficient. Pooling of funds would allow the IR Iran to achieve better spreading of risks, form rich to poor and from healthy to sick. This is the objective of insurance: to spread risks from those with resources to those who need services. The current configuration does not fully achieve this objective. The small pools limit the potential for cross-subsidy.

Fragmentation can also involve segmentation in any country, leading to “inequity by design.” This has been the experience of many low and middle income countries, especially in Latin America.

The lack of pooling is inefficient. The lack of pooled funds increases administrative costs. This means funds are wasted on administration relative to high quality services. As discussed in the last section, duplication of coverage and sometimes service responsibilities can be an issue. Relative lack of pooling further decreases the ability to leverage benefits from strategic purchasing. Multiple purchasers dilute incentives to increase provider performance.

Globally, there are different approaches to pooling. For example, in Japan, a single pooling fund was created in 1983 so that costs would be shared equally by the multiple insurers that developed over time. This single pool pays for 70 percent of all costs (Ikegami 2006). A second model is to adjust payments to insurance pools retrospectively based on relative risks. This can be found in Germany. A third model is to adjust premiums or payment rates as in the Netherlands. Income-related contributions are paid into a risk equalization fund, which equals 50 percent of total insurance revenue. Premiums are based on community averages. A fourth model is to pool either at a national level (e.g., Sweden and United Kingdom) or to pool at regional or provincial levels (e.g., Canada and Kazakhstan).

23 The picture for the SSO is characterized by holdings from pension and health being reinvested through its Social Security Investment Company, which has capital investments in 187 companies in IR Iran, and controls, for example, 35 percent of pharmaceutical production, 43 percent of pharmaceutical distribution, 35 percent of cement production, 37.3 percent of wall tile production, and so on.
There is no “right” or “best” arrangement for pooling of funds. As with all reforms, the essential starting point for decision makers is an understanding of existing arrangements. Both theory and evidence suggest, however, that from this starting point, reforms should aim to reduce fragmentation of pooling. Options for doing this vary considerably across countries.

In IR Iran, pooling might take two tracks related to the timeframe available. In the short run, the health sector should assess disparities across risk pools and develop a risk adjustment mechanism across payers. Some regulatory framework and stewardship capacity would be needed, but this would increase equity and better spread risks, and encourage purchasers to better manage purchasing arrangements. It would create a virtual single pool for all. These types of mechanisms are technically achievable and are currently found in multi-insurer group systems in OECD countries as outlined above (Japan, the Netherlands, and in Germany, for example) as well as in middle income countries such as Czech Republic and Morocco.

In effect, IR Iran could create a virtual single pool among the multiple pools through the establishment of a redistribution fund. This can be achieved through risk-adjusted allocations to various insurers. The experience of the Czech system is instructive. Czech reforms appear to have achieved success by subjecting the entire insurance pool to redistribution (thereby maximizing the scope for risk protection), and at the same time lowering the benefits from risk selection for the competing insurers.

Box 6-2: Czech Republic Risk-Adjustment Reforms

The 2003 law introduced complete pooling of the state payment and all collected premiums that are redistributed between insurers on a capitation basis adjusted for age and sex (36 age/sex categories). Each insurer reports monthly the total amount of its collected premiums, as well as the number and age structure of its insured. State payments for economically non-active citizens flow directly to a special account operated under the oversight of insurers and the Ministries of Health and Finance. The account’s manager then calculates the total amount of income (collected premiums + state payment) per “standardized” insured for the whole system and the income of each insurer based on its actual number of insured and their age/sex structure. Differences between collected premiums and income of a particular insurer after redistribution are cleared within days by one-off payments between insurers and the manager of the special account. Data provided by an individual insurer may be checked by a specialized task force consisting of representatives of all insurers or by the ministries. Also, the data on redistribution results are available to all insurers so that they can follow reports of their competitors on a continuous basis.

In addition, because all prospective risk adjustment systems fail to predict all variation in expenditures, the system includes an ex-post partial compensation of expensive cases (a standardized methodology of accounting costs to individual insured was issued together with the 2003 law). If the annual costs of a client reach the limit of 25 times the average annual costs per client in the whole system, the insurer is compensated with 80 percent of the over-the-limit costs. Advances to cover expensive cases are divided between insurers based on historical numbers. Differences against the actual cost of expensive cases are set once a year when the prior year’s financial results are published. In 2005 the compensation of expensive cases included 0.2 percent of the total population and redistributed 5 percent of total funds between insurers.


Retrospective risk adjusters, as discussed in Text Box 6-1 above, can dilute insurer (purchaser) incentives to manage care and manage costs. Therefore, relative retrospective adjustments vary across countries and should be implemented prudently, allowing some opportunity for the purchaser to contain costs. The Czech Republic example is one of a minimal retrospective risk adjuster.
Other countries have chosen to maintain multiple public funds, but are introducing a unified regulatory framework to harmonize the rules that govern these funds. An example from the Middle East region includes Morocco, which recently established a unified health insurance regulatory body. Lebanon is also proposing to harmonize the payment systems across the different public funds.

A number of other middle income countries with multiple public funds are opting to consolidate them to reduce the administrative complexities and costs. Examples of countries that have recently consolidated the multiple health funds include: Poland (14 to 1), Estonia (22 to 7), Kyrgyz Republic (7 to 1), and Tunisia (3 to 1).

The Iranian government has been working to unify different funds. Historically, these funds were operating as separate identities within MOHME and were regulated by a High Council. A Ministry of Welfare and Social Security has recently been established, bringing these funds under its umbrella.

Longer run, the government might consider a unified single pooled system of funding a core package of services for all citizenry. This model is currently found in the United Kingdom, the Nordic countries such as Sweden and Norway, Canada, and in many GCC states. The model would lower administrative overhead and provide increased leveraging of purchasing and commissioning of services (see below).

The obstacles to full single pooling can be both technical and pose political obstacles. The obstacles might mean full pooling would need to be done slowly over time. One example is Chile, which implemented a set of reforms including pooling over a 15 year time frame (Box 6-3).

**Box 6-3: Public Financing Reforms in Chile**

In 1985, Chile implemented a radical reform of the health system (together with structural reforms in the old-age pension system). It separated the insurance and financial administration from public provision of health care services and created the National Health Fund (FONASA). FONASA was financed by a combination of general taxation (to subsidize the contributions for the poor, who are included in the pool from general taxation) and a 7 percent payroll tax contribution from formal sector workers (public and private). The reform aimed to consolidate all public financing for health in a single fund, reducing duplication and establishing the basis for implementing strategic purchasing in the public sector. FONASA consolidated the Ministry of Health Financing (from general taxation) and the public Social Insurance Scheme for formal workers (abolished in 1985). Through subsequent reforms in the mid-1990s and a final set of legal reforms in 2004, FONASA has become the most important insurer in the country, covering almost 80 percent of the population. FONASA is mandated to collect and pool all public revenue for health and use it to purchase services from public and private providers. The implementation of the FONASA reform has taken more than 10 years. Consolidating all resources was a complex technical and political process. FONASA’s consolidation as the health service purchasing agency in the public sector has been particularly complex and required substantial political and technical efforts in the 1990s.

**Resource Allocation and Purchasing**

Elements of strategic purchasing are emergent in IR Iran, but a significant agenda remains to capture value for money expended. The insurance systems have initiated activity, but often there is no coordination across insurers, and arrangements are diluted, not allowing the full impact of needed behavior change toward more cost-effective care provision.

Many countries have adopted a general purchasing health services framework (Preker and Langenbrunner 2005) that specifies a number of components of purchasing, specifically:
• Core policy characteristics or “policy levers” that can be utilized for allocating resources by purchasers across geographic areas or directly to providers;
• Organizational characteristics of purchasers and providers and the incentive regimes within organizations; and,
• Institutional characteristics, embedded in the transactions that occur between different organizational units emanating from the government and across both public and private sectors. This area is similar conceptually to the World Health Organization Year 2000 report which discussed this area as stewardship of the health sector.

A fourth component, and one that crosscuts the three components above, is management. It is very much intertwined with the institutional environment (e.g., stewardship, governance, and autonomization). Management, organizational, and institutional characteristics have been addressed in Section 6. This section will focus on core policy levers the government might exercise.

In the short run, the government should better focus on core policy levers it has at its disposal. These policy levers are outlined in Table 6-10, and discussed each in turn below.

Table 6-10: Policy Levers Related to the Uses of Financing

<table>
<thead>
<tr>
<th>Core Policy Levers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Demand or “Population Coverage” (for whom to buy)?</td>
</tr>
<tr>
<td>• Supply or “Benefits Package” (what to buy, in which form, and what to exclude)?</td>
</tr>
<tr>
<td>• Factor and product markets or “Contracting” (from whom, at what price to buy and how much to buy)?</td>
</tr>
<tr>
<td>• Prices and incentive regime or “Provider Payment Systems” (at what price and how to pay)?</td>
</tr>
</tbody>
</table>


“For Whom to Purchase Services?” Reaching All in the Public System

As previously noted in this section, the government has made great strides in extending coverage step by step. In the last two years, a new rural Health Insurance system has extended coverage to an estimated 23 million rural residents. Nevertheless, challenges remain for covering all of the population. Universal coverage is the norm for all EU and OECD countries, except the United States.

Ten percent to 25 percent of the population remains uncovered. Official statistics provide lower bound estimates, but surveys suggest higher prevalence of uncovered groups. With the new rural health insurance system, the biggest single group that remains outside the current insurance system may be the urban private sector, which probably correlates with the informal sector (Schneider 2006). The Iran Expenditure and Income Surveys suggest the uncovered may be decreasing over time, but lack of coverage is found disproportionately among the lower income groups as shown in Figure 6-27. Indeed, coverage has slipped back for the lowest two income deciles to 1990 levels.
A second issue is that under the current insurance system, some insured groups and some regions may not be receiving equity of access and equity to quality of services. The MOHME and other government leadership have expressed deep concerns about reaching the poor and rural groups in a well targeted fashion, and reaching the still-uncovered.

**Population-Based Targeting.** In the short run, the easiest approach technically is move toward more population-based allocation methods. Several countries on varying income levels (e.g., the United Kingdom, Sweden, Poland, Lithuania, and the all payer insurance system in the Netherlands) have in the last decade developed new geographic allocation formulas to be based more on per capita or “demand side” principles relative to older “supply side” normative. This would be especially important for IR Iran, and could be done through risk adjusters in premiums or in adjusters in the allocation and payment systems.

While data is not available to look at patterns of all public spending for each province, budget allocations by province for MOHME budgets are available. Figures 6-28 shows significant swings in per capita allocation by province, with little correlation with poverty rates by region. This is a signal that geographic allocation formulas may be useful as a policy tool. Figure 6-29 regresses per capita against incidence of poverty again showing a weak correlation of the two measures.
Figure 6-28: Per Capita Allocation of MOHME Budget and Incidence of Poverty by Province
Rials Billions (2006)

Source: SCI and MOHME.
Note: For per capita calculation, the latest and available population estimate (2005) was used. Medical universities or centers in respective provinces may have independent budgets, apart from the MOHME budget allocation. Incidence of Poverty in Khorasan province was 28 percent. The regional disaggregated poverty rates (north, south, and Ravasi) were not available.

Figure 6-29: Correlation: Incidence of Poverty and Per Capita Allocation
From MOHME Budget by Province (2006)

Source: SCI and MOHME.
Note: For per capita calculation, the latest and available population estimate (2005) was used. Medical universities or Centers in the provinces may have independent budgets, apart from the MOHME budget allocation. Incidence of poverty in Khorasan province was 28 percent. The regional disaggregated poverty rates (north, south, and Ravasi) were not available.
Internationally, most population-based formula funding mechanisms are based on the following formula for funding to region $i$:

\[
\text{Allocation}_i = \text{PerCap} \times \text{POP}_i \times (1+a_i) \times (1+n_i) \times (1+c),
\]

where $\text{PerCap}$ is the per capita budget (total allocation divided by national population), $\text{POP}$ is the population of each region, $a$ is an adjuster for needs by age and gender (areas with more elderly or women of reproductive age than the national average, for example, would receive a higher allocation), $n$ is an adjuster for health need (so an area with higher mortality or especially high morbidity might receive more funding), and $c$ is an adjuster for cost (health care in a sparsely populated area, for example, might cost more to provide). All these elements are reflected in one of the original funding formulas developed in the 1970s for the United Kingdom NHS—the Resource Allocation Working Party formula (RAWP).

Defining need in a population usually begins with the size of the population. Other things being equal, a population of two million is assumed to have doubled the needs of a population of one million.

The second element of most funding formulas in health is some adjustment for differences in need for services across age groups and between men and women. The age use of services generally follows a fairly common pattern with relatively high use among the under-fives diminishing during childhood and teenage years, and then a steady increase for men while female use increases substantially during the reproductive years. International variations tend to emphasize local cultural and technological factors and also the age at relative life expectancy.

<table>
<thead>
<tr>
<th>Country</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland—to local government</td>
<td>Age, disability, remoteness, local tax base</td>
</tr>
<tr>
<td>Belgium</td>
<td>Age, gender, unemployment, disability</td>
</tr>
<tr>
<td>Germany</td>
<td>Age, gender</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Age, gender, urbanization, funds income base</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Age, gender region, funds income</td>
</tr>
<tr>
<td>Need-based—core</td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td>Age, children of single parents</td>
</tr>
<tr>
<td>England</td>
<td>Age, SMR, unemployment, elderly living alone</td>
</tr>
<tr>
<td>France</td>
<td>Age</td>
</tr>
<tr>
<td>Italy (2/3)</td>
<td>Age, gender, mortality</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>Age, gender, mortality, low birth weight</td>
</tr>
<tr>
<td>Norway (50%)</td>
<td>Age, gender, mortality, elderly living alone</td>
</tr>
<tr>
<td>Scotland</td>
<td>Age, gender, mortality, rural costs</td>
</tr>
<tr>
<td>Portugal (15%)</td>
<td>Burden of illness: diabetes, hypertension, tuberculosis</td>
</tr>
<tr>
<td>Spain</td>
<td>Cross-boundary flows</td>
</tr>
<tr>
<td>Sweden</td>
<td>Age, living alone, employment status, housing</td>
</tr>
<tr>
<td>Wales</td>
<td>Age, gender, mortality, rural costs</td>
</tr>
</tbody>
</table>

*Source: Ensor (2005).*

At a small area level, these differences in age and gender can be extremely important. Between large populations (more than 500,000), however, the extent of demographic variation is usually quite small.
The third part of the formula is to adjust for differences in need that are not explained by demographics on their own. Ideally, what is required is some objective and representative measure of need for services after adjusting for demographic characteristics.

In the first phase, a new regional formula could be developed based on population. These levels could be adjusted to reflect need. Best practice is to focus on three to seven factors or variables that reflect need and policy priorities (Table 6-11 above). For example, need could be addressed through age/gender adjusters because men and women on average require different levels of services as they grow older. Beyond age/gender adjusters, levels of poverty, rurality, and priority health outcomes such as infant mortality could be used as proxies for need. Higher relative levels could determine correspondingly higher funding levels. Once the formula is developed, it could be phased in over a period of several years. Politically, implementing this all at once could create opposition from wealthier regions. But, this change could be phased in over three to five years to allow regions to adapt to the new budget allocation formula.

There are some other considerations as well as each region’s fiscal capacity to raise and manage funds on its own. The development and the implementation of the formula would need to be concurrent with a broader fiscal analysis related to national–regional funds flows.

Longer term, a second phase would be to pool and mix funds from the insurance organizations for regional allocation. This section has already noted that a significant share of funds come from these systems parallel to the Ministry of Health system.

A third phase might further refine the allocation formula for performance indicators such as improved primary care and outpatient services. This “performance-based budgeting” concept is increasingly being utilized by countries in every part of the world for health and other sectors such as education and transport. The second phase might also adjust for cross-boundary issues such as rural populations seeking care in high end secondary and tertiary centers in large cities like Tehran.

**Service Level Targeting.** In terms of access and quality at the service level, more diagnostic work is first needed on the benefit–incidence of who is receiving services, where, and what barriers continue for the poor and vulnerable groups. The Bank team learned that one such analysis was finished by MOHME in July 2006, under Dr. Naghavi, and this will be published. Currently, as individuals move up across income groups, they tend to use private sector services relative to publicly delivered services. The government and public sector facilities are viewed as residual facilities for those who cannot afford nongovernmental provision. Upper income groups rely almost entirely on private provision of services.

**“What to Buy”? Refining and Standardizing the Benefits Package**

Iranian health financing schemes provide generous benefits packages, inpatient and outpatient services and surgical procedures that include laboratory radiology investigations, drugs, rehabilitation services, prosthesis, and in certain cases even dental services. Packages usually provide access to both public and private providers, increasing choice and access to services.

The specifics of the package vary according to the insurance or program scheme providing benefits. In MSIO programs there are three separate levels of benefits:

- Preventive and primary health care services with an MOH network of providers in rural areas and public and private clinics in urban areas;
- Outpatient services; and,
• Inpatient services.

The package has changed over time. In the rural health insurance program, outpatient benefits have been added to the former package of preventive and public services plus inpatient benefits. It has also expanded the number of drugs on its positive list from 50 to around 400. There is a current effort to combine the package into a unified package, but there is no date for implementation.

The SSO has a different package again for its covered population. The AFMSO has its own package. Multiple public and private insurance schemes decide individually on their package of covered services.

The package across public funding groups should be standardized for equity reasons. It should further be transparent for both consumers and providers. This will help cut down on the use of informal payments, though the measure by itself will be insufficient for eliminating informal payments.

As the burden of disease increasingly shifts to non-communicable diseases and prevalence of chronic diseases, preventive and promotive services, as well as screening services, become important. The provision of early treatment can prevent longer-term complications and can help reduce costs overall.

Once the package is standardized, it should be reviewed on an ongoing basis. A first step might be development of a negative list whereby outdated technologies, devices, and procedures are removed from the package. Any unnecessary services might be removed as well. Co-payments and deductibles already exist, but a re-examination of its structure could generate new revenues and discourage overutilization of certain types of services. Conversely, it could help address issues increasing OOPs over time (as discussed above) and issues of high OOPs for essential items such as pharmaceuticals, especially among the medically vulnerable and lower income groups. This latter issue is discussed in more detail later in the section.

Further, the MOHME might consider establishing a small organizational unit to formally and rigorously assess issues of benefits as new technologies and procedures become available. The unit would develop assessments based on internationally recognized analytic methods such as cost-effectiveness analysis, technology assessment, and evidence-based protocols. Traditionally, these types of analysis and assessments have not been part of the decision and policy process by insurance organizations.

“From Whom to Buy?” Contracting for Improved Cost and Quality

Currently, as discussed in detail in Section 5, there is significant external contracting with providers across all insurers. In some cases there is a network of self-owned facilities: for example, the SSO has 51 hospitals, 270 outpatient facilities, 10 day clinics, and 30 administrative offices. At the same time, the SSO and other insurers extensively contract with private providers for services.

Contracting has developed over time as the private sector has developed. IR Iran has a well developed and active private sector, primarily concentrated in urban areas and playing a major role in the secondary and tertiary level care services. Section 5 and the recent WHO Health Sector Profile (2006) report almost the entire pharmaceutical industry and drug distribution system is private as is a large share of laboratory and diagnostic facilities. There are over 150 private hospitals nationally, both for-profit and nonprofit. More than 80 percent of all physicians are estimated to have some private practice, often in the afternoon, and often commingled with their public sector contract. Approximately 85 percent of outpatient specialists are private. Overall, experts estimate private sector activity at approximately 20 percent of all expenditures (MOSW 2006). The 2002 Health Care Utilization Study placed private provider activity at 18 percent of hospitalizations but a full 66 percent of ambulatory services (MOHME 2003).
The rural health insurance program has also gone to greater private sector contracting for services, especially when only private providers exist in certain catchments areas. It does so by first contracting with the district health authority; the authority in turn develops contracts with providers.

At the same time, contracting is simple and used for reimbursement of claims. These are soft, relational contracts with all willing providers. There is no known selective contracting on the basis of quality and performance. The Bank encourages immediate development of management and information systems (MIS) facility pilots that would adapt standard approaches to capturing clinical and cost information. This information could be used as the basis for negotiation with insurers and with public purchasers of services.

A series of pilots have been developed in three geographic areas to date focused on chronic management areas such as asthma and diabetes. These have been supported with good contracting rates of payment and have associated quality and outcome indicators. These pilots might be expanded. These might be developed along similar specific disease management lines that promise more cost-effective provision. These areas might include:

- Diabetes;
- Asthma;
- Hypertension; and,
- Mental health services.

For example, better management of diabetes might result in less renal failure, a costly medical situation for individuals and families.

In geographic areas with few or one provider, contracts could still build in performance benchmarks for improved performance. These benchmarks could be matched with some type of performance payment bonuses.

Secondly, the MOHME should consider initiation of internal contracts with staff of public facilities. The contracts would be used in the first two to three years to assess performance and provide feedback. After three years, the contracts would be used to hire and fire personnel according to performance and input needs for care services. Thirdly, the MOHME facilities should continue the contracting of selected services (laundry, food, laboratory, and diagnostic services) in its public facilities. This could continue to both improve quality and cut costs.

Article 88 of the Third Five-Year Plan sets out provisions for the outsourcing of mainly support areas of public services as discussed in Section 5.\(^\text{24}\) In 2000, in accordance with the Third Five-Year Plan, Article 192 required the MOHME through the provinces to transfer the management (but not the assets) of health facilities to the private sector, be these cooperatives, private persons, companies, or NGOs. The idea was for provinces to use other sectors for service provision. The provinces initially presented proposals for management transfers and contracts were elaborated. These transfer contracts have been used mainly in

\(^{24}\) From 2002, the expansion of outsourcing in government health facilities has been rapid. Typical services for outsourcing have been transport, equipment, maintenance, postal service, IT services, catering, security, and cleaning. An evaluation of 41 pilot hospitals – one in each of the Universities of Medical Sciences – indicated that within a two year period hospitals had outsourced cleaning (88 percent), catering (81 percent), gardening (73 percent), laundry (66 percent), and central sterilization rooms (37 percent). Further, within MOHME services such as heating, cooling, air conditioning, publishing, transport, secretarial service, and maintenance were outsourced. During an 18 month period into 2003, manpower was reduced by 167 persons in the pilot hospitals. Savings was estimated at USD 750,000.
urban areas and for urban health centers, and for some wards and clinics of district hospitals. A lesser number are found in rural health centers with rural health houses excluded from the process.

Article 192 allows employees to remain as public employees but to work for private managers. All displaced workers from the public sector are transferred within the public sector. Article 136 of the Fourth Five-Year Plan allows this program to continue.

Results reported have been mixed to date with proponents citing savings and improved quality of services; opponents have pointed out a lack of management capacity to monitor the contracts and outsourcing has sometimes gone to those with inadequate technical expertise.

Contracting always requires some caution, and requires among other things:

1) A competitive environment;
2) Well-defined services;
3) Coordination with public sector activities;
4) Assessment of quality of private management;
5) Specification of service standards; and

Nevertheless, approaches here might be expanded and selective contracting utilized.

“How to Pay” Implementing New Incentive Payment Systems

Table 6-12 shows the recent funds flows to providers across the public and private sectors.

<table>
<thead>
<tr>
<th>Provider Type</th>
<th>1991</th>
<th>1996</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total, all health providers</td>
<td>1,486.7</td>
<td>1,315</td>
<td>1,766</td>
</tr>
<tr>
<td>Public health providers, all sources</td>
<td>451</td>
<td>378</td>
<td>528</td>
</tr>
<tr>
<td>Health providers from Social Security Organization</td>
<td>42</td>
<td>53</td>
<td>102</td>
</tr>
<tr>
<td>Public providers from government payers</td>
<td>515</td>
<td>449</td>
<td>659</td>
</tr>
<tr>
<td>Private charity and nonprofit institutes</td>
<td>22</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>University-related health providers from private payers</td>
<td>3.9</td>
<td>7.6</td>
<td>13.3</td>
</tr>
<tr>
<td>For-profit and private institutes, all payers</td>
<td>945.2</td>
<td>841.8</td>
<td>1,074</td>
</tr>
<tr>
<td>Private health providers, all payers, including households</td>
<td>971.7</td>
<td>865.6</td>
<td>1,106.1</td>
</tr>
</tbody>
</table>

Source: Kermani (2004).

IR Iran has a rich variety of provider payment systems in public insurance programs, as outlined in Section 4 for Primary Health Care and again in Table 6-13. However, the multiplicity of forms and the variation across payers probably dilutes the impact of these policy tools for encouraging efficiency and quality. There is a further over-reliance on fee for service (FFS).
Table 6-13: Government Insurance Programs: Summary of Provider Payment to Physicians, Staff, and Facilities (2006)

<table>
<thead>
<tr>
<th>Provider/Service</th>
<th>Payment Method</th>
<th>Patient Co-Payments (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary and preventive services (Health houses, rural health centers, health posts, urban health centers) Physicians and staff Facilities</td>
<td>Salary Line Item</td>
<td>0</td>
</tr>
<tr>
<td>Private Physician Visit Procedures</td>
<td>Per case FFS</td>
<td>45–50</td>
</tr>
<tr>
<td>Public hospital clinics and centers GPs Specialists</td>
<td>Salary Salary + FFS % 25 for MSIO enrollees 30 for all others *</td>
<td></td>
</tr>
<tr>
<td>Social Security-owned clinics GPs Specialists</td>
<td>Salary + Per Hour Per Case + 0–10% bonus Salary + % Per Case 30</td>
<td></td>
</tr>
<tr>
<td>Other government clinics / SSO-contracted clinics GPs</td>
<td>Salary 30 *</td>
<td></td>
</tr>
<tr>
<td>Outpatient pharmaceuticals, laboratory, radiology, and diagnostic services</td>
<td>FFS</td>
<td>National drug list – 30 Insurance drug list – 30 Other drugs – 100 Laboratory, radiology, and diagnostic services: 30 public facility 50 private facility</td>
</tr>
<tr>
<td>Inpatient care (public)</td>
<td>19 line item budgets for 50–60 percent of all revenues 0 for Imam Khomeini Foundation enrollees Tariffs from public insurers and private insurers, including per diems for hotel services and fee for service for selected services Rural households: 25 All others 10 Fixed tariffs for pharmaceuticals Physicians/nurses on salary, with FFS for each of 60 ICD categories of case-based payment accounting for about 15 percent of income Facility health workers also can receive bonuses from facility-based income pools</td>
<td></td>
</tr>
</tbody>
</table>
Inpatient care (private)

Physicians: FFS + profit sharing

Health personnel: Varies: some combination of salary, bonus, and FFS


* Outpatient services co-payments are waived for selected groups of poor and vulnerable populations such as those eligible under Imam Khomeini Foundation.

Tariffs or fees for services are determined at two basic levels for the public and private sectors. Formally, there are only two schedules (each suggested by the Health Insurance High Council (HIHC) then approved by the Council of Ministers) for public and private payers. Each is published. The public fee schedule uses an old 1995 version of California CPT/Medicare coding system in the United States. A base amount is established annually and each year it is updated based on population changes. The base amount in 2005 was Rls 24,000. Informally, there are multiple schedules. For outpatient physicians, for example, there are different types of fee schedules: three to four in the public sector and multiple schedules in the private sector.

Anecdotally, it is reported that the medical association: sets its own tariffs for private services, and fee differences with the public sector can be as high as tenfold. This may account for differences in revenue streams between the public and private sectors as seen in Table 6-12 above.

For primary and preventive services (health houses, rural health centers, health posts, and urban health centers), physicians and staff are salaried, and facilities are provided line item budgets. For outpatient curative services, a variety of methods are utilized as Table 8-5 shows. In addition, there are co-payments of 25–30 percent in the public sector, and higher for services from private providers: 45 percent for GP visits and 50 percent for specialists. For private insurance organizations, co-pays vary between 0 to 20 percent of the costs of outpatient services and between 0 to 35 percent of the cost of inpatient services, depending on the fee schedules set by the insurer, or the fee schedule negotiated between private insurer and providers.

On an outpatient basis, about 12 years ago, a system of general practice and gatekeeping of referrals was passed into law. However, it was never implemented. Patients continue to prefer self-referring to specialists. Average contacts per person per year was 8.4 visits per capita per year in 2002 (MOHME 2003) as reported in previous sections. In SSO contacts per capita are higher: 9.5 for contracted providers but as high as 12–13 for internal network facilities (MOSW 2005). These numbers on average for the country and for the SSO are very high by international standards; and these rates are three to four times the average per capita in EU-15 countries.

Payment to pharmaceuticals, laboratory, radiology, and diagnostic services is fee for service. Both the national drug list and the insurance-based drug list are covered by insurance with a 30 percent co-payment. Other drugs are 100 percent out-of-pocket. Laboratory, radiology, and diagnostic services on an outpatient basis similarly have co-pays of 30 percent in the public facility and 50 percent in a private facility.

Public and parastatal hospitals and staff are paid on the basis of

1) 19 Line Item budgets for 50–60 percent of all revenues.

2) Tariffs from public insurers and private insurers, including per diems for hotel services and fee for service for selected services.
3) Fixed tariffs for pharmaceuticals.

4) Physicians and nurses are on salary, with fee for service for each of 60 ICD categories of case-based payment accounting for about 15 percent of income. Facility health workers also can receive bonuses from facility-based income pools.

5) The tariffs, as with outpatient services, are set by the physician association’s High Council but must be approved by the Cabinet.

6) Patients face a 10 percent co-payment.

Line item budgets tend to be subsidies without accountability for performance. Public sector (government) line item allocations are usually directed at salaries of permanent staff, capital investment, recurrent financing, and additional subsidies for special conditions (e.g., Thalassaemia) and procedures (e.g., hemodialysis).

Budgetary allocations for salaries again take into account inputs and not outputs, with the approved official capacity of the hospital. The amount is reviewed annually during consultations with the hospitals. As such, budgetary allocations are determined based on the following formula:

\[ \text{Budgetary Allocation} = \text{Number of active beds} \times 1.7 \times (\text{recommended staff/bed ratio}) \times 1.35M \text{ Rials} \]

A number of pilots are testing greater accountability and performance, such as bonuses to physicians in the public sector hospitals based on both quantitative and qualitative criteria including consumer satisfaction. No evaluations have been made available.

Within the SSO network, for example, providers are paid 85 percent salary and 15 percent per case. It is pretty much the reverse in contracts with providers outside the network, using fee for service (FFS). There are pharmacy and labs contracts on FFS as well.

Revenues to private hospitals occur through contracts with insurance organizations such as SSO. The payment system varies, from FFS to per diem to per case. No good numbers are available on numbers using different payment approaches. Patients must also pay the 10 percent co-payment. Anecdotally, there is the perception that informal payments are more common in private facilities, and that tariff schedules deviate from publicly approved schedules and are set on an individual contract basis.

Physicians in private facilities are most often paid on FFS basis, but also share in facility profits. Health personnel payment varies, with some on salary only, some on salary plus bonus, and still others on salary, bonus, and some percentage on fee for service to encourage volume.

There are some SSO per capita pilots, though limited to a number of its own internal facilities. In the contracted facilities, tariffs are higher. The SSO pays a set rate, with the remainder left as balance billing for the patient.

One of the more encouraging programs is the new primary care payment program in the new rural Health Insurance program. It has increased the overall level of funds for primary care and provided high levels of payment for providers generally. It also pays a base salary supplemented with a weighted capitation approach, with performance bonuses for the following a list of criteria such as population density, distance from other health centers, performance quality, availability in the office, and residency at the site. The bonuses can add up to more than the base salary rate itself.
Co-Payments: How Well-Targeted?

Co-payments are waived for selected groups of poor and vulnerable populations such as those eligible under Imam Khomeini Foundation. These are also waived in rural areas for preventive and primary care visits. Nevertheless, evidence suggests that co-pays and OOPs generally go to different items across income groups (Figure 6-30). Upper income and privileged groups under private insurance coverage enjoy relatively low co-pays. Public insurance programs have more substantial co-payments. Overall, lower income groups spend more of their share of OOPs on pharmaceuticals, whereas upper income groups spend a greater share on presumably more discretionary services such as dental care. This has not fundamentally changed over time (Figure 6-30) since 1990. This may suggest co-pays are not as well targeted as could otherwise be to protect the lower income groups.

**Figure 6-30: Composition of OOPs across Income Deciles (2005)**


Note: For households with OOPs >0.

**Figure 6-31: Expenditure on Pharmaceuticals as a Percentage of Total Household Expenditure on Health (1990–2005)**

Discussion: Purchasing of Services

Optimal payment systems do not exist. Rather, payment systems and incentives need to be designed and developed to address the specific policy issues and objectives inherent in a nation’s health care sector. Table 6-14 outlines the performance of various payment systems on various criteria.

Table 6-14: Provider Payment Methods and Indicative Incentives for Provider Behavior

<table>
<thead>
<tr>
<th>Mechanisms</th>
<th>Prevention</th>
<th>Delivery/Production of Services</th>
<th>Cost Containment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Item Budget</td>
<td>+/-</td>
<td>-</td>
<td>+++</td>
</tr>
<tr>
<td>Fee for Service (FFS)</td>
<td>+/-</td>
<td>+++</td>
<td>---</td>
</tr>
<tr>
<td>Per Diem</td>
<td>+/-</td>
<td>+++</td>
<td>---</td>
</tr>
<tr>
<td>Per Case (e.g., DRGs)</td>
<td>+/-</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Global Budget</td>
<td>++</td>
<td>--</td>
<td>+++</td>
</tr>
<tr>
<td>Capitation</td>
<td>+++</td>
<td>--</td>
<td>+++</td>
</tr>
</tbody>
</table>

*Source: World Bank (2005).*

*Note: The number of “+” and “-” signs reflect potential for benefits and potential for unintended consequences, respectively.*

The current mix of incentives may be perverse. On the one hand there are line term subsidies and guaranteed salaries but without the ability to manage services and staff overall, nor the ability to develop mechanisms of accountability. The line item budgets are then overlaid with fee for service (FFS) systems which may encourage utilization without linkages to performance and improved outcomes.

The provider community in IR Iran strongly favors FFS payment for all types of services. This is understandable, as FFS tends to encourage higher volumes and higher expenditures on health services, thus increasing the flow of revenues to providers. And FFS can be a powerful tool to deliver priority services and to reach special population groups such as the poor or those in remote regions. But, the government must be very careful about adapting FFS for all services. Significant inflationary effects of FFS payment systems are well established—in the United States, Canada, Czech Republic, Japan, parts of Russia, and other countries. The government might want to be careful in considering FFS payment systems, and consider doing so only in the context of an overall spending cap and/or very stringent administrative mechanisms which prevent increases in service volume. In general, utilization patterns and input mix analysis suggest IR Iran will need to move away from reliance on FFS for outpatient curative care and move away from input-based budgeting for facilities.

On the outpatient side, the payment incentives might actually be reversed from the current structure. Primary and preventive services would move from salary and line item and be paid FFS to encourage utilization of priority services. Outpatient curative care, on the other hand, might move to a capitation or fund holding approach over time. This would discourage apparent overutilization patterns evident in the SSO utilization rates reported to the Bank.

In EU countries, three models have dominated physician services historically: salary, capitation, and fee for service or some combination. In general, physicians in private practice are paid on a fee for service basis while salary, capitation, or some combination tend to dominate as payment methods for service provision in the public sector; though countries like France and Germany also pay on a fee for service basis for all patients. But FFS in these countries differs from FFS in IR Iran. Very importantly, FFS
systems in these countries in Europe are subject to an overall cap on total expenditures and prices and volume are determined only within the target ceiling.

Some models have been undergoing almost constant change and evolution. In England, some purchasing responsibility in the early 1990s was allocated to selected general practice (GP) fund holders with at least 11,000 patients registered with them. Their budgets typically covered up to 20 percent of the total per capita allocation for each patient; the remainder rested with the health authority. Initially, 306 practices joined; by 1998 there were 3,500 GP fund holding practices, covering 60 percent of the population.

The new Labour Government abolished fund holding in 1997 and established a nationwide system of primary care groups (PCGs)/primary care trusts (PCTs). Unlike fund holding, which was voluntary, membership of a PCG was compulsory for all GP practices. The average PCG covered a population of 100,000 people, although variations occurred around the average ranging from approximately 50,000 to over 250,000 people. Over time, PCGs have been converted into Primary Care Trusts or PCTs. These are free standing bodies with a budget for contracting and commissioning care, including inpatient care, covering average populations of 170,000 people and controlling about 75 percent of the overall national budget for health. Table 6-15 outlines models in EU countries currently.

<table>
<thead>
<tr>
<th>Country</th>
<th>Salary</th>
<th>Capitation</th>
<th>Fee for Service</th>
<th>Combination</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1) Northern NHS-model/Tax-Based Health Systems</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td></td>
<td>X (Hospital-Based)</td>
<td>X (Public)</td>
<td>X (Private)</td>
</tr>
<tr>
<td>England</td>
<td></td>
<td>X (Hospital-Based)</td>
<td>X (Public)</td>
<td>X (Private)</td>
</tr>
<tr>
<td>Finland</td>
<td></td>
<td>X (Hospital-Based)</td>
<td>X (Public)</td>
<td>X (Private)</td>
</tr>
<tr>
<td>Ireland</td>
<td></td>
<td>X (Hospital-Based)</td>
<td>X (Public)</td>
<td>X (Private)</td>
</tr>
<tr>
<td>Norway</td>
<td></td>
<td>X (Hospital-Based)</td>
<td>X (Public)</td>
<td>X (Private)</td>
</tr>
<tr>
<td>Sweden</td>
<td></td>
<td>X (Hospital-Based)</td>
<td>X (Public)</td>
<td>X (Private)</td>
</tr>
<tr>
<td>Norway</td>
<td></td>
<td>X (Hospital-Based)</td>
<td>X (Public)</td>
<td>X (Private)</td>
</tr>
<tr>
<td>Portugal</td>
<td></td>
<td>X (Hospital-Based)</td>
<td>X (Public)</td>
<td>X (Private)</td>
</tr>
<tr>
<td>Spain</td>
<td></td>
<td>X (Hospital-Based)</td>
<td>X (Public)</td>
<td>X (Private)</td>
</tr>
<tr>
<td><strong>2) Southern &quot;NHS&quot;-model/Tax-Based Health Systems</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3) Social Health Insurance-Based Health Systems</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Austria</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>France</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td></td>
<td>X</td>
<td></td>
<td>X (Free Practicing)</td>
</tr>
</tbody>
</table>

Source: Langenbrunner et al. (2005).

For facilities and inpatient care services, IR Iran will probably need to move away from input-based budgeting for facilities. Many countries in the region have moved away from these input-based budgets often coupled with salaries for providers. Often with a purchaser–provider split under insurance, the system of payment is then re-oriented toward services or activities, as measured by outputs or even outcomes. This is reinforced by the early experience in the 1980s of many health insurance systems in Western Europe/North America that were developing or utilizing service-based systems of payment. Today, more sophisticated purchasers increasingly attempt to link payment with service performance,
service outputs, and ultimately, patient health outcomes (although the latter is still not employed much). They may also couple these performance-based mechanisms with demand-side mechanisms such as co-payments or deductibles.

Within the hospital sector, most countries in Western Europe have moved to a performance-based approach, using some combination of payment per admission based on a case mix adjusted diagnosis-related groups (DRGs) while subject to some overall volume cap often termed a global budget. A global budget collapses all line items into 1 line item to provide maximum flexibility for resource use within an overall envelope of resources. Within this general model, some diversity of approaches to payment for inpatient services is in evidence throughout the EU and most have developed related to efficiency and cost containment objectives.

The Islamic Republic of Iran can move to some combination of global budgets and case mix built on its 60 ICD-based case payment categories developed for surgical interventions, and might extend up to 150 categories, which would provide enough comparative data for payment purposes. Case mix groupings are often used for medical review and quality assurance as well. Case mix groupings are composed of two streams of concurrent activity: (i) statistical and cost analysis and (ii) clinical teams developing groupings based on both clinical coherence and relative resource homogeneity. These two streams are outlined in Figure 6-32.

Case mix groupings can be used as the basis for adjusting global budgets for hospitals. Steps for developing a hospital global budget can be found in the Box 6-4.
Box 6-4: Steps for Implementing a Global Budget for Hospitals

1. Develop a “baseline” (one to three years) data base of patient utilization and costs;
2. Analyze utilization patterns, including patient flows, across facilities and geographic areas;
3. Analyze expenditure patterns by:
   – demographics (age/sex); and
   – mix of patients (e.g., by diagnostic categories);
4. Adjust per capita budgets for differences in costs across age/sex groups in a particular catchment area served;
5. Adjust budgets for differences in patterns of utilization;
6. Subtract from this “base budget” target levels of inappropriate and unnecessary patterns of care and associated costs. For example, inappropriate admissions, pre-admission duplication of testing, and, alternatives to hospital care, such as care on an outpatient basis or in day care centers for “social cases;”
7. Develop draft budget of appropriate and necessary care, based on expected volume and case mix;
8. Develop sharing agreement on who receives expected surpluses generated by new efficiencies, typically some portion to both facility and to the payer;
9. Develop rules for unexpected risk related to levels of patient demand and or expenditures; and,
10. Final negotiation and signing of contract.

Moving to global budgets would, furthermore, be consistent with policies aimed at greater autonomy of providers as discussed in Section 6.

Uniform Rates and Incentives across All Payers

The government should strongly consider a new and more consistent set of payment rules and systems across insurers. Variations across payers can distort incentives providers face, and it can distort practice patterns by encouraging overuse of highly paid services by some payers while at the same time it can discourage access for relatively poorly paid services and discourage equitable treatment for groups under some payers relative to others. New payment systems need to restructure incentives but uniform rules across payers will also help improve equity across groups.

In summary, then, the government should move to drop line item budgets and stop its over-reliance on FFS. Section 4 discussed a strategic use, but current reliance goes far beyond a careful use of FFS. Payment systems over not developed and implemented overnight, and some testing and piloting might be initiated. These could be done in selected provinces, and with facilities developing improved costing and information (MIS) systems. This could begin immediately. Pilots could include both urban and rural areas.
Conclusions and Recommendations

Clearly, IR Iran has made enormous progress over the last several years in extending insurance coverage to almost all of its population. The country enjoys increasingly sophisticated health insurance organizations to manage and purchase services on behalf of their enrollees. The rural health insurance program is the latest milestone in this progress since the revolution.

Secondly, the Fourth Five-Year Plan (Section 2) calls for increased public sector funding and better financial risk protection for all of its citizens. The recent trends in expenditures suggest IR Iran is in a period of significant expansion of funding for the health care of its citizens. This is not necessarily unexpected relative to global trends. Countries growing in GDP and in transition from developing to developed status demonstrate positive income elasticity of greater than 1.0 for spending on health (Schieber and Maeda 1997; Gottret and Schieber 2005). Simply stated, countries on average tend to increasingly value the relative importance of investing in health, health status, and health care as income grows. Health is increasingly perceived as less of a consumption good and more as an investment in productivity, fiscal stability, and macroeconomic growth longer term.

Related, countries are beginning to pool more of funding under publicly managed programs and rely less on individual out-of-pocket spending. The relative differences in sources of funding across countries are shown in Figure 6-33.

Figure 6-33: Changing Patterns of Sources of Funding: Public Sector Funding and OOP Funding for Health as GDP Increases

![Figure showing changing patterns of sources of funding](image)


At the same time, the health sector leadership faces enormous challenges. The section has discussed several issue areas now before the leadership, including:

- Health financing statistics are not easily available and not standardized relative to international methodology nor standardized over time, making it difficult to track sources and uses of funds, and (correspondingly) to use data for improved decision making.
- Health financing is complex and not transparent. As a system that has developed piecemeal programs over time, it is now overly complicated, duplicative, and not easily understandable to leaders or consumers.
• Not everyone has insurance coverage; out-of-pocket payments incur catastrophic expenses; and the segments of the population most affected are often those without coverage.

• There is ineffective revenue collection, including avoidance and under-reporting of funds to be contributed by both formal and informal sectors. Revenue collection is inequitable and not structured according to income or assets as in many developed countries and some developing countries (e.g., Columbia).

• There are dozens of uncoordinated and fragmented risk pools; as a result, there is little risk pooling to spread risks from rich to poor and healthy to sick. More funds per capita are spent on the upper income groups and socially privileged. This hurts the poor, vulnerable, and sickest groups.

• The multiple insurance schemes create unnecessary waste and result in higher than necessary administrative costs in insurance.

• Expenditures appear to be growing at a rapid pace. IR Iran is already a relatively big spender in the region, and by global standards at 7.8 percent of GDP which is within OECD range. Within a few years, policy makers may need to be concerned about overall macro-level efficiency. The recent changes in overall expenditure estimates could be worrisome over time. It creates additional uncertainties for policy makers and budgeters. Demand for health care will grow significantly by year 2020 due to population dynamics alone (Figure 6-34).

• There is growing evidence that funding is not well targeted or well spent, raising issues of both micro-level efficiency and equity. The public budgets of MOHME are inequitably allocated. The line item and FFS payment systems of insurers appears to be leading to over utilization, possibly provision of unnecessary services. The incentives in place encourage both organizational rigidity – discouraging real organizational change – while at the same time encouraging induced demand and cost escalation without real impact on health status.

• High formal and informal payments by consumers affect all income groups but may be hurting access and quality for lower income groups.

• There is little or no governance, nor regulation of the financing system in the private sector. Service tariff regulations are ignored. Nor is there governance to coordinate across public and private sectors for either financing or coordination of financing and provision.
Figure 6-34: Expected Increases in Health Expenditures from Years 2000–2020 Due to Population Dynamics


A number of activities and policy steps can be envisaged both short-term (one to two years) and medium-term (three to five years) to address some of these challenges.

**Short-Term Recommendations (One to Two Years)**

1) **Institutionalize the national health accounts (NHA) process.** The NHA updates of every four years or so are not sufficient in a rapidly changing environment. The government will need to input as precise information as possible into the NHA matrices and update them annually or at least every two years. Reliable spending information is essential for rational resource allocation decisions for both the public and private sectors. Workshops and regional networks in the last few years have helped to train experts in NHA methods. Expertise exists in IR Iran. The next needed step is for the government to utilize this training and institutionalize the process of NHA.

2) **As Part of the NHA Work, Produce NHA Tables Disaggregated by Income Quintile and by Provinces.** This work can be the basis for high level monitoring of equity in resource allocation. This can also be used later as the basis for a geographic allocation formula or a premium adjuster across payers.25

3) **Evaluate the Impact of the new Rural Health Insurance scheme.** Little more than anecdote is currently available. The size of the reform and its objectives make this an important evaluation: to provide family practice to everyone, to contract with both public and private providers, to provide benefits for the rural populations in a more equitable way with urban populations. An impact analysis should be utilized to refine and extend reforms, especially to rural poor.

4) **Study and Evaluate Who Currently Lacks Insurance Coverage.** IR Iran undertakes annual household surveys. A special instrument should be developed for the next survey to understand gaps in coverage and the extent of duplicate coverage.

5) **Streamline Revenue Flows and Collection of Funds for Health.** The government should consider options for new revenue sources and collections of funds for health services. In considering different options, several impact criteria must be utilized including

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25 This recommendation is based on analytic work from L. Hawkins, WHO consultancy on geographic allocation formula, December 2006.
**Economic efficiency:** Do changes in revenue flows hurt production capacity or relative efficiency in production and allocation of goods and services? Whenever governments extract resources from the private sector through taxation, the economic cost in most cases exceeds the amount of resources extracted. This efficiency cost results from tax-associated production and consumption inefficiencies that distort decisions made by firms and households. Excessive tax burdens are directly related to the behavioral response of the taxed entity and the tax rates; the greater the responsiveness and rates, the greater is the excess burden;

- **Equity:** Is there an adverse impact on lower income groups, the poor, or the vulnerable?
- **Administrative simplicity:** Successful changes in tax policy can be achieved only through effective tax administration. Effective tax administration and policy means eliminating unproductive taxes and keeping differential tax rates and provisions to a minimum.
- **Transparency:** Tax provisions must be clear and communicated effectively.
- **Revenue levels:** What is the potential for actual revenue generation? How do these levels compare with current flows?
- **Impact on Insurance Coverage:** Current tax provisions link contributions with coverage in some programs. Does this approach hinder full coverage of the entire population?

6) **Study and Evaluate the Role of Informal Payments.** Quantitative and qualitative studies should evaluate the breadth and depth of informal payments: how much patients pay for what services. What are the social and economic roots of this practice and what are the options for addressing this issue, especially for the lower income groups. Proposed solutions could be a mix of economic incentives, legal changes, and administrative strictures.

7) **Improve Pooling of Funds of the Government’s Public and Social Insurance Sectors.** Assess disparities across risk pools and develop a risk adjustment mechanism across payers. Some regulatory framework and stewardship capacity would be needed, but this would increase equity and better spread risks, and encourage purchasers to better manage purchasing arrangements. It would create a virtual single pool for all. These types of mechanisms are technically achievable and are currently found in multi-insurer group systems in OECD countries as outlined above (Japan, the Netherlands, and in Germany, for example) as well as in middle income countries such as Czech Republic and Morocco. In effect, IR Iran would create a virtual single pool among the multiple pools through the establishment of a redistribution fund.

8) **Standardize the Benefits Packages Across Payers and Develop Capacity to Update the Package on a Continual Basis.** The package across public funding groups should be standardized for equity reasons. It should further be transparent for both consumers and providers. This will help cut down on the use of informal payments, though the measure by itself will be insufficient for eliminating informal payments.

As the burden of disease increasingly shifts to non-communicable diseases and prevalence of chronic diseases, preventive and promotive services, as well as screening services, become important. The provision of early treatment can prevent longer-term complications, and can help reduce costs overall.

Once the package is standardized, it should be reviewed on an ongoing basis. A first step might be development of a negative list whereby outdated technologies, devices, and procedures are removed from the package. Any unnecessary services might be removed as well.
The MOHME should establish a small organizational unit to formally and rigorously assess issues of benefits as new technologies and procedures become available. The unit would develop assessments based on internationally recognized analytic methods such as cost-effectiveness analysis, technology assessment, and evidence-based protocols. Traditionally, these types of analysis and assessments have not been part of the decision and policy process by insurance organizations.

9) Change the Contractual Arrangements with Staff in all Public Facilities. The MOHME should initiate new internal contracts with staff of public facilities. The contracts would be used in the first two to three years to assess performance and provide feedback. After 3 years, the contracts would be used to hire and fire personnel according to performance and input needs for care services. The MOHME facilities should continue the contracting of selected services (laundry, food, laboratory, and diagnostic services) in its public facilities. This could continue to both improve quality and cut costs.

10) Improve Allocation and Purchasing of Services in the Public and Social Insurance Sector. The IR Iran should follow the lead of a number of countries in both Eastern and Western Europe and in Asia that have moved to change their resource allocation methods or to be more strategic in the way funds are allocated for services. A new formula based on per capita principles should be developed for the MOHME budget allocations. The new formula can be phased in over time to allow regional areas to ready for the impacts. Secondly, new payment systems for insurance organizations should be developed for all levels of care to help address the current overutilization of services, while providing more incentives for hospitals to innovate and modernize. These new models should be reviewed and approved for pilot testing in one or more regions.

Medium-Term Recommendations (Three to Five Years)

1) Create a New Single Payer Fund with Universal Coverage. Create a new form of “purchasing” or resource allocation model in which a public, or quasi-public, third party payer is organizationally separate from all health service providers. This would split out public providers under MOHME and SSO. The public purchasing fund (PPF) organization could be part of the MOH or MOWSS or somewhere in the central government. International experience suggests there is no single best model, but purchasing is often placed outside the MOHME (or even MOWSS) might initially to provide flexibility, distance the purchaser from the provider, and better provide leadership as a sectoral change agent.

Overall, the new PPF would have several advantages:

- Encourage and help expedite the purchaser–provider split in the public sector;
- Provide the organizational support for pooling all sources of public funds for health care, and save administrative overhead;
- Provide increased flexibility in resource allocation relative to line item budget constraints while developing advanced payment incentives for public and private sector providers;
- Provide a single contracting source for all providers, and over time could be selective and performance-based;
- Serve as purchasing agent for all Iranians whether covered or not covered by insurance currently. This could improve equity and access and reduce financial risk to vulnerable groups of the population.

A second option would be to create new purchasing organizations (PPFs) at each regional or provincial level. The government has a stated policy of decentralization. This would help
decentralize the public sector but could require more effort and local technical capacity to start up new organizations in 30 different administrative regions. In some countries, such as Russia, regional purchasing funds have been a failure for more than a decade due to a lack of local capacity and local involvement of political interests. The public sector risk pool could also be very small in some regions, another potential issue. But, there is the medical university infrastructure already in place in IR Iran which could serves as the platform for these regional purchasers. The question is whether these organizations could provide capacity for claims processing, MIS systems, and payment systems and so on necessary for purchasing arrangements.

Regardless of whether central or regional in scope, the PPF should begin to pool funds from all public insurance health systems, and for MOHME curative services. MOHME would retain budgets for other key functions such as research, medical education, quality, accreditation and licensing, and basic public health infrastructure. Privileged but parallel health systems for privileged groups and civil servants demonstrate similar problems in Eastern Europe, Latin America, and countries in the Organization for Economic Co-operation and Development (OECD)—risks are not pooled, and funds are not effectively utilized.

In addition, the purchasing fund should have a sitting board of trustees guided by annual audits of performance and fund flows.

2) **Evaluate Current Contracting Pilots, and Extend by Service and Geographic Areas.** A series of pilots have been developed in three geographic areas to date focused on chronic management areas such as asthma and diabetes. These have been supported with good contracting rates of payment and have associated quality and outcome indicators. These pilots might be evaluated now and later expanded. These might be developed along similar specific disease management lines that promise more cost-effective provision. These areas might include:

- Diabetes;
- Asthma;
- Hypertension; and,
- Mental health services.

For example, better management of diabetes might result in less renal failure, a costly medical situation for individual and family. In geographic areas with few or one provider, contracts could still build in performance benchmarks for improved performance. These benchmarks could be matched with performance payment bonuses of some type.

3) **Initiate New Provider Payment Pilots in Three to Five Provinces.** The new payment systems design should be tested in a selected number of regions or provinces and evaluated. The payment pilots will require several “enabling factors” as well to get started and to be successful. This included adequate MIS systems for payer and provider, facility autonomy and contracting arrangements, and new quality assurance systems to counter any unintended consequences of the new structure of behavioral incentives. These pilots will take a few years to design and to develop the needed enabling infrastructure. Once the pilots are completed and evaluated, refinements can be developed and new reforms extended nationally.

4) **Create a new National Health Sector Board.** This board would provide the platform for coordination of the public and private sector financing and purchasing of services. The board would oversee the tariff schedule for payers, help develop a unified benefits package for all, and oversee new purchasing and payment reforms. The board would work with the other parts of the government.
to set overall expenditure targets, monitor quality and access. The Minister of Health and Medical Education could chair an oversight or coordination council.
Section 7
The Pharmaceutical Sector:
Production, Distribution, and Utilization

Introduction and Overview
Pharmaceuticals encompass issues of production, regulation, and governance. They are also critical factor inputs into the access to care and the delivery of services. The relative income levels and population of the Islamic Republic of Iran (IR Iran) makes it a significant pharmaceutical market. The size of the pharmaceutical market was about USD 1.5 billion in 2006 (at retail prices, excluding government subsidies). This market is, however, modest compared to some of its neighbors: the pharmaceutical market in neighboring Turkey, which has about the same population as IR Iran and a GNI per capita of USD 4,710 versus USD 2,770 per capita, is more than four times the size of the Iranian market (World Bank 2007; IMS 2005).

The section looks at a broad range of issue areas including:

- Administration, regulation, and pricing;
- Domestic industry and trade;
- Demand and market for pharmaceuticals;
- Financing of pharmaceuticals by insurers and consumers; and,
- Access to and rational use of pharmaceuticals.

Box 7-1: Summary Points

Before 1979, Iran had a thriving domestic drug industry which was dominated by foreign ownership. After the Islamic Revolution, the drug industry changed to centrally controlled manufacturing of purely generic drugs.

More recently, policy turned back toward the introduction of market mechanisms, private ownership or “corporatization” of publicly-owned companies, and favoring of branded generics, allowing companies to market their products in competition with each other.

Most of the drugs on the Iranian market today are locally manufactured (95 percent in volume, 72 percent in value). Access to markets and product prices are regulated. Local industry is protected against foreign competition by tariffs up to 90 percent on imported drugs.

Iran's pharmaceutical policy is guided by a National Drug Policy, which favors a generic drug policy. There are limited protections for innovation with local investments. International patents are not recognized. Certain life-saving or disease-modifying patented drugs that cannot be locally made are procured by the MOHME and subsidized at the import level. This creates incentives for smuggling these drugs out of the country.

Counterfeit drugs have been discovered in certain areas; a defense strategy against it is one of the priorities of the MOHME.

Through the primary healthcare system and insurance benefit packages, patients have access to essential medicines at low costs, but the overall share of out-of-pocket payments is estimated at 45 percent of the entire market and growing, and affecting access by the poor (World Bank 2006).
Administration, Regulation, and Pricing

Legal Framework

The National Drug Policy of IR Iran provides the basic framework for regulation. It was developed with World Health Organization (WHO) input and defines policy goals such as a generic drug policy, equity of access to important drugs, standards for quality in manufacturing and distribution, registration and reporting standards, and guidelines for rational drug use. The actual drug law, providing detailed guidance for administration and market participants, is relatively old. It dates back to the time before the revolution and has been amended since by several ministerial decrees. A major effort is required to develop an entirely new drug law, reflecting current international standards of regulatory practice. Discussions have started but a definite timeline for the development of new legislation has not yet been established.

Administrative Functions

The Deputy Minister for Food and Drugs in the Ministry of Health and Medical Education (MOHME) has executive authority over the pharmaceutical sector. This department fulfills the role of the regulatory body, with responsibility for:

- Selection of new drugs that are permitted to file for registration. (This is unique; usually drug selection is done after registration for the purpose of defining formularies and giving access to public funding.) The decision lies with a Listing Committee, which is organized by the department. The committee has 15 members, of which only one represents the payer side (though this person is on the payroll of the MOHME). The list is generic (INN names only) and includes close to 1,700 generic drugs with about 5,000 dosage forms.
- Registration of drugs;
- Pharmacovigilance;
- Rational use of drugs; and,
- Providing subsidies for certain drugs for special conditions such as MS, transplantation, thalassemia, hemophilia, and certain cancers.

A centralized benefit management system for specialized drugs, through a patient database covering 70,000 patients throughout IR Iran, has recently been implemented in the deputy ministry for foods and drugs within MOHME and about 70 percent of the respective patients have been registered and their drug consumptions monitored. There are negotiations to transfer subsidy funds to the Ministry of Welfare and once this happens, the insurance organizations would control the entire management program for these drugs.

A significant number of employees of the MOHME are sponsored by the national industry. This creates potential conflict of interest and may interfere with the need to establish and enforce a rigid regulatory framework for this industry.

The organogram for this deputy minister is provided as Figure 7-1.
The Food and Drug Control Lab (under MOHME) offers a broad range of lab services; in addition to food and cosmetics labs, it has a conventional pharmaceutical lab as well as a biological lab, recombinant molecule and microbiology lab. The management of FDCL is trying to upgrade the lab and achieve international Quality standards (Good Laboratory Practice – GLP). The initial efforts (2004) have been focused on the vaccine lab, which already passed 6 of 12 WHO criteria. Recently the vaccine lab and the National Regulatory section concerned with vaccines have been prequalified by WHO. Investments have also been made into new equipment and qualified staff in FDCL. The main hurdle for achieving the GLP standards are restrictions due to an undersized old building that is located in a downtown neighborhood and exposed to the pollution of urban Tehran. The current program of upgrading the old building and implementing additional elements of GLP is expected to deliver results within three years, but limits due to the building situation will remain.

The current throughput of the pharmaceutical lab is about 1,000 samples per year, which can be handled without major delays. It is not clear whether the capacity of the lab could be increased significantly within the limitations of the current building; a capacity increase may be necessary once a countrywide post-marketing surveillance scheme for drugs is implemented.

The FDCL sits in the center of a lab network that includes 42 university labs and about 20 certified private labs. Collaboration in upgrading and quality management has been initiated but, according to Iranian experts, needs to be developed further in order to reach international standards.

**Inspection**

There is a central function for inspection in the MOHME, in charge of supervising/auditing all inspectors and performing inspections of manufacturers, distributors, and countrywide labs. Inspections of pharmacies are done by inspectors in the medical universities, now a part of MOHME due to implementation of an integrated health and educational system in 1985. Inspections of medical university...
and private labs are a responsibility of the central lab (FDCL). Inspectors work according to detailed inspection checklists. In pharmacies, they perform inspections in teams of two (SSO and MSIO 2006).

**Pricing Regulation**

Drug prices for nationally manufactured drugs are set by a pricing commission under the responsibility of the MOHME. Pricing is done on a cost plus basis; the profit margins granted are low in comparison with interest rates, making it questionable how the industry can operate without losing money – assuming that cost data are accurate. As inputs for cost data, the commission uses receipts from procurement of raw materials as well as standard cost estimates for the manufacturing process. These factors differentiate only between pharmaceutical forms but do not account for different degrees of investment costs in terms of technical complexity in formulation. Generic or branded drugs from foreign manufacturers can be registered and imported if the generic name is listed and the manufacturer has a license from the FDA or a European country. Importers have to pay up to 90 percent import duty on all products that compete with local drugs. Random local pharmacy checks in late 2006 found that in the case of a frequently used drug (alprazolame), the imported version costed about three times as much as the locally made product.

For imported originator drugs that are not subsidized, the MOHME sets a price based on the international price quoted by the manufacturer, plus a composite margin of about 40 percent, which covers importer, wholesaler, and retailer. Recently, the MOHME began to make price comparisons with other countries (Spain, Turkey, Greece, and the original country) and uses these to negotiate with manufacturers/importers, rather than just accepting the quoted price.

A similar practice is used for the drugs that are subsidized, although the distribution margin is lower: the MOHME tries to adjust it to the true distribution costs for these drugs that have typically a high value per unit. For certain drugs such as Desferral (used for Thalassemia), the MOHME has set up its own distribution channel, such drugs are typically used in selected centers only.

**Professional Associations**

Although formally independent nongovernmental organizations, the professional bodies such as the Pharmacists Association and the Medical Council (physicians association) are performing certain roles on behalf of the government, such as issuing professional licenses, handling malpractice complaints, and performing continuing medical education (CME) programs for their members. For physicians, a minimum amount of CME credits are required for a license renewal (that is, the license to practice in a given territory, not the general license obtained with the university degree).

The physicians association is in the process of setting up a decentralized system to handle not only malpractice complaints, but also several other complaints regarding violations of professional codes or practices. This system also covers (in theory) prescription of non-listed drugs or other forms of misuse of pharmaceuticals, but it is passive only (based on complaints from patients or other professionals). To date, there is no central collection of data from cases handled by district or provincial structures of the organization.

**Pharmaceutical Industry and Trade**

**National Industry**

The local industry in IR Iran dates back more than 60 years. Prior to the revolution, most companies were foreign-owned (Basmenji 2004). The revolution led to a mandatory buy out by the government and a
fully state controlled industry. During eight years of war with Iraq, the priority was to secure supply and self-sufficiency with cheap generic drugs. Ten years later the industry was privatized again, but most shares are still in public hands with the Social Security Organization (SSO) as the single biggest shareholder. This leads to a situation today in which SSO is the biggest buyer of the drugs that are made by companies belonging to SSO.

There are more than 60 independent manufacturers in IR Iran, showing a high degree of fragmentation. Most have relatively old facilities (Figure 7-2). The biggest company is Darou Paksh, also owned by SSO, which has about 11.5 percent market share. There are also more than 20 API manufacturers (Active Pharmaceutical Ingredient), although the majority of APIs are procured from India, China and Spain.

**Figure 7-2: Average Age of Manufacturing Sites (Age Range in Years)**

![Average Age of Manufacturing Sites](chart)

*Source: MOHME (2006).*

The SSO exerts control over its companies through a financial holding structure (Shasta Holding) that has a majority stake in 28 companies and a minority holding in four companies. It also controls 55 percent of the distribution network with two companies and 45 percent of the API manufacturing in IR Iran. Although the SSO is the majority shareholder of this holding with 65 percent (the remaining 20 percent are held by institutions, about 15 percent are in private hands), the managing director is a government appointee. Share prices of the holding and other pharmaceutical companies at the Tehran stock exchange have risen by about 60 percent in the last year against general market trends, although net profit margins are below inflation. This points toward market expectations for consolidation and more profitable growth in the future, based on expected future political decisions.

The holding organization controls the boards of the 28 companies in which it has a majority share. It also appoints the general manager. But it appears that despite these far-reaching powers, no significant steps have been made yet to utilize synergies, consolidate and save costs across the portfolio of small independent manufacturers. One of the hurdles appears to be the absence of a law that clearly regulates mergers and acquisitions. Overall, it appears that the “privatization” of the pharmaceutical industry has not yet led to truly independent companies with a clear focus on the market and strategies for sustainable growth in the future.

The industry received about USD 60 million of direct subsidies during 2003–2005 for modernization of machinery and facilities. Nevertheless, no single factory has been certified for internationally good
manufacturing practices (GMP) yet. Recently, a classification system has been introduced that categorizes sites according to GMP level, offering certain priorities to those that are at highest level: they are allowed to make copies of innovative drugs, which have higher profit margins than older generics. Industry executives state that it is difficult for them to get access to financing for new investments. The interest rates of national banks are too high compared to the low profitability of a business that is restricted by external price controls. Foreign banks have shown less willingness due to perceived political risks. Without significant investment, the industry – as a whole – will have problems surviving once the World Trade Organization (WTO) accession forces the government to open the market and reduce protectionist measures.

Overall output of the industry is about 26 billion units per year (Iranian Pharmaceutical Manufacturers Association 2006). Most of these drugs are used in the national market. The MOHME data estimate a per capita consumption of about 370 units of domestically produced drugs, which corresponds to a bit more than one pill per day per citizen.

The business model of the industry is oriented toward the domestic market and the bureaucratic pricing procedures that attempt to establish a rational cost plus pricing model. This model does not provide incentives for rationalization and cost control. In order to maintain profitability despite pressure on prices, there is a temptation to enhance profits by overpricing or colluding with providers of raw materials. In any case, this orientation of management energy toward “beating the system” rather than improving efficiency and innovating to become globally competitive creates a problem for long-term sustainability of the sector, should WTO membership in the future erode the current protective barriers (since currently, foreign companies have to pay a 90 percent import duty for drugs that compete directly with locally manufactured drugs).

International manufacturers have a small but growing presence in IR Iran, mostly through drugs that are seen as essential but too difficult to manufacture for the local industry. The government’s policy toward them has changed, and there are attempts now to encourage external investment in the national industry. Multinationals who enter into a partnership with a domestic manufacturer for the production of a new drug can obtain five years of marketing exclusivity. The first two agreements of this kind were signed with Roche and Sanofi-Aventis, and a number of others are in negotiation.

**Distribution and Retail**

The Islamic Republic of Iran has a fully developed distribution system with more than 7,000 retail pharmacies and 15 national as well as several regional wholesalers. There are more than 800 hospital pharmacies, some of which are also allowed to dispense drugs to outpatients. Margins for wholesale and retail are regulated.

The fixed prices for generic drugs lead to a volume competition by manufacturers of equally priced brands of the same generic. By filling the distribution pipeline with free drugs (volume rebates), manufacturers try to drive out competitor drugs and enhance brand loyalty. The financial benefit stays with the wholesaler and retailer. The dimension of these rebates is not known. Pharmacies are relatively small, and there is usually not enough shelf space to store more than one or two alternatives of the same generic. Pharmacists are allowed to exchange one brand for another of the same generic drug and price (substitution). This gives them influence on the selection if there are competing brands. Distribution margins are relatively low in international comparison (Table 7-1).
Table 7-1: Distribution Margins for Standard Pharmaceuticals

<table>
<thead>
<tr>
<th>Margin in Percentage Increase</th>
<th>Price (Index 100%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex-factory</td>
<td>15–25</td>
</tr>
<tr>
<td>Wholesale</td>
<td>12</td>
</tr>
<tr>
<td>Retail</td>
<td>21</td>
</tr>
<tr>
<td>Combined over ex-factory</td>
<td>35</td>
</tr>
</tbody>
</table>


For subsidized, imported drugs, the margin is calculated on the subsidized price. The subsidy is applied at the level of importers, who invoice the lower, subsidized price to wholesalers and receive the subsidy amount from the MOHME.

Drugs that are not listed can be obtained with a special permit from MOHME, which requires a relatively detailed application from the treating physician. If approved, the drug is imported through a few specialized “international pharmacies.” Patients have to pay the full costs.

In addition to the official channels, there seem to be “grey” import channels for certain branded drugs that are not listed, for example, via Dubai. The demand is most likely generated by doctors who received training abroad or by patients who got treatment abroad. Given the bureaucracy and costs involved to use the official MOHME exception procedure, the grey import is lucrative. Many pharmacies (estimates from official inspectors are about 50 percent) sell grey market products “under the table.” Sanctions are not very heavy even if caught. The problem is that such grey channels can create a significant risk for the entry of counterfeit drugs: given the fact that the distribution is hidden from the official inspection system, it is unlikely that counterfeits sold through these channels would be discovered. If illegal drugs are found in a pharmacy during inspections, these can be confiscated. However, so far, it is not standard practice to verify whether these drugs are authentic or counterfeit. Confiscated drugs are under the control of the judicial system, so drug inspectors or the MOHME do not have easy access to these for testing purposes.

There is also a “black” market for unregistered, no-name drugs of dubious origin and composition, which should also be classified as counterfeits, although these have to be distinguished from fake copies of established brands. These are sold outside regular pharmacies, in fitness studios, cosmetic salons, or on street corners. Some of these products are used as an alternative for narcotics or to cure withdrawal symptoms. In one example, an injectable drug smuggled from a neighboring country was used in several institutions that treat heroin addicts until authorities received reports of side effects of the type initiated by overuse of steroids (Cushing Syndrome). It turned out that this product consisted of a mix of morphine, heroin, steroids, and a morphine-antagonist.

The MOHME is now planning a study to assess the dimension of the counterfeiting problem in some test areas, initially with a focus on medicines that are relevant for public health and that already have been reported as counterfeit in anecdotal cases.

The Market for Pharmaceuticals in the Islamic Republic of Iran

Overall market size (2005 data) is about Rls 14,000 billion, equivalent to USD 1.5 billion, of which some 250 million USD is subsidized by the government (MOHME 2006). This figure is based on retail prices and includes over-the-counter (OTC) drugs. The subsidies are paid directly to the importers for certain expensive drugs. It does not include the “grey market” of illegally imported drugs. A total of 5,000 different registered products (< 1,700 different active substances) are legally on the market.
Market growth has been accelerating in recent years and is expected to exceed 30 percent in the current year (Table 7-2). The MOHME expects that the drug market will double over the next four years. Imported drugs are much more expensive and therefore have a significant and growing share in value, although in volume these account for less than 5 percent of the total market (Figure 7-3). Drug prices are controlled and therefore lag behind general consumer price inflation.

Table 7-2: Market Share of Domestic and Imported Drugs (2005)

<table>
<thead>
<tr>
<th></th>
<th>Value %</th>
<th>Units %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic</td>
<td>71.9</td>
<td>95.4</td>
</tr>
<tr>
<td>Imported</td>
<td>28.1</td>
<td>4.6</td>
</tr>
</tbody>
</table>

Source: MOHME, SSO, and MSIO.

Volume growth (Figure 7-4) is much slower than growth in value, which demonstrates that the unit price increase is a major factor for growth in expenditures. Most of the expenditure growth is due to imported drugs, but locally manufactured drugs show a significant volume growth.

Per capita consumption is about 370 units per year, at a value of approximately USD 20. This is relatively low in terms of value (per capita spending on drugs in Turkey for example is about four times as high); however (artificially) low prices of domestic drugs distort the picture.
The most recent data available from 2001 (MOHME 2006) suggest that access to essential drugs in the primary health care system is satisfactory. On average, more than 90 percent of marker drugs were available in the centers sampled for the study. Drug prices were lower than international benchmarks and affordability was good (cost of a pneumonia treatment less than 2 percent of the lowest public sector salary). There were some deficits in labeling, which is a potential concern for compliance problems.

As previously mentioned, a unique INN-based drug selection system exists in the MOHME, which permits listing of new drugs before registration considering accessibility, affordability, and safety of the new molecules producing the Iran National Formulary (INF). The decision for inclusion of a new drug into INF lies with a Listing Committee, which is organized by MOHME. The committee has 15 members, of which only one represents the payer side (but is on the payroll of the MOHME).

The INF constructs the basis for the drug reimbursement list developed by insurance organizations. The decision to include a new drug into the drug reimbursement list is made by the High Council of the insurance organizations. Pressures on the Council are significant, and the decision making process appears neither very structured nor transparent.

Although the health insurance system in IR Iran is somewhat uncoordinated, with different payers pooling resources for subgroups of the population (see Section 6), the drug reimbursement lists are virtually unified. Each company and organization has its own reimbursement list, which is unified for all insurers, and minor differences exist amongst various drug reimbursement lists.

Drugs that are included in the insurance reimbursement lists are reimbursed at 70 percent of the retail price for outpatients and 90 percent for inpatients. There are no exemptions for co-payments. However, in the case of outpatients, the total amount of co-payments is limited by an individual ceiling and patients have to submit a claim to their insurance organization and get a refund for payments exceeding the ceiling. This means there is a potential financial barrier for poor people who receive expensive prescriptions or treatments and have to pay 30 percent of the costs out-of-pocket. Even if they are entitled
to a refund later, they will need to provide the necessary funds initially. Section 6 presented evidence from IR Iran’s survey of household income and expenditures showing a bigger burden on the lower income groups and a burden that has been increasing as a share of income since 1990.

The recent advent of the Rural Health Insurance program has meant that limited formularies of 193 drugs are covered on primary care level. There are also prescription limits in terms of volume and drug spending amounts to 25 percent of total spending of this fund.

Hospital drug budgets and consumption data are not centrally available. Hospitals pay for drugs out of the overall budget and the payment system does not pay for drugs separately. There is anecdotal information that some hospitals are using the drug budget as a reserve to cover overspending on other areas, leading to a chronic shortage of drugs. Instead, they send patients to obtain drugs from outpatient pharmacies. While this allows the facility to shift drug costs from the hospital budget to the outpatient system, patients have to pay 20 percent more when purchasing hospital drugs from outpatient pharmacies (i.e., reimbursement of drugs dispensed in the hospital for hospitalized patients is 90 percent versus 70 percent in outpatient pharmacies).

The overall share of drug expenditure for the large insurance organizations, the Social Security Organization (SSO) and the Medical Services Insurance Organization (MSIO), is each in the range of 30 percent of total expenditure. Insurers pay directly to pharmacies on a monthly basis. Patients have to pay their co-payments and dispensing an out-of-pocket fee. For physicians that have a contract with the insurance organizations, there is the possibility of financial penalties if the physician causes unjustified high costs for prescription drugs. However, only one to two percent of physicians are sanctioned this way in any year. The insurers have relatively complete data about prescribing behavior, collected from pharmacies in electronic format although with delay. The use of these data for developing a more sophisticated system for monitoring prescribing behavior and rewarding rational prescribing appears possible, but is not yet reality (See Section 8 on HMIS).

There are a relatively small number of physicians with prestigious reputations as specialists who do not sign contracts with the insurance organizations. Nevertheless, in the current system their prescriptions are still covered by the insurance if the drug is on the INF. The insurers have no means at the moment to influence prescribing behavior of these physicians. Many of these privileged or “celebrity” specialists work in parallel in public hospitals and their private clinics, using the public system to recruit patients into their private practice and then charge fees several times above the (low) public fees offered by the insurers. This creates a risk of overdiagnosis and overtreatment with subsequent impoverishment of patients, who may come from a low income background and need to sell off assets in order to pay their bills. As in many middle income countries, political and economic influence of these celebrities puts them above full accountability, making it difficult to change the status quo without political intervention. Pharmaceutical expenditure caused by these privileged specialists is significantly higher than average, and growing rapidly (according to SSO data). Prescribing expensive imported drugs is usually part of the “value proposition” that justifies the reputation as celebrity expert.

Financing of Pharmaceuticals

The large insurance organizations (SSO, MSIO, AFMSO, and IKF) are financed partially through a payroll tax or flat contribution rate, and/or through direct subsidy from the state (see Section 6). Pharmaceuticals that are included in the national formulary INF are reimbursed at a rate of 70 percent. In addition to the co-payment of 30 percent, the patient has to pay a dispensing fee of USD 0.30 or USD 0.50 (depending on the price of the drug). The latter is part of the pharmacy’s revenues (MOHME 2006).
The MSIO’s drug budget increased in 2006 by 11 percent. At the current level of spending, it is likely that real expenditures will grow by 20 percent per year. It is expected that at the end of almost any fiscal year, the government provides a bail out to cover remaining deficits. This expectation at the end of the year eliminates incentives for more cost containment efforts. This is demonstrated, too, in the lack of management systems for physicians’ prescribing behavior despite the fact that SSO and MSIO have data showing significant deviations from evidence-based use of medicines.

A number of relatively expensive imported drugs for the treatment of conditions such as multiple sclerosis, transplantation, thalassemia, or certain forms of cancer are imported under control of the MOHME and subsidized from MOHME budget at import level. The patient pays the co-payment on the subsidized price.

Hospital drugs are financed though hospital budgets, with no central allocation or monitoring of drug procurement and spending. This probably wastes funds and discourages transparency (see above).

The MOHME estimates that 55 percent of the current pharmaceutical market is financed from public money, with 45 percent out-of-pocket. However, updated reliable data are not available. The rate of private spending for drugs in urban areas with a large number of private physicians may be higher.

There are a number of private insurance options for Iranian citizens covering drugs that are not on the reimbursement list. These are used only by a small part of the population, typically the higher income groups.

**Rational Use of Medicines**

Data on drug utilization show that the use of antibiotics and injections is high. Both are typical markers for nonrational drug use: physicians tend to use injections more for transactional reasons than out of medical necessity. This possible overutilization, however, creates infection risks and higher risks of side effects for patients. Antibiotics are frequently prescribed for minor viral infections as a precaution rather
Table 7-3: Top 20 Drugs in Total Expenditures in IR Iran in Year 1384 (2005)

<table>
<thead>
<tr>
<th>Rank</th>
<th>INN, dosage</th>
<th>Form</th>
<th>Value (Rial)</th>
<th>Trend (vs. Previous Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AMOXICILLIN 500MG CAP</td>
<td>CAPSULE</td>
<td>352,159,536,400</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>ACETAMINOPHEN CODEINE (300+20) TAB</td>
<td>TABLET</td>
<td>319,578,753,200</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>CEFIXIME 400MG TAB</td>
<td>TABLET</td>
<td>232,468,262,400</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>CEFTRIAXONE 1 GR VIAL</td>
<td>VIAL</td>
<td>196,019,136,300</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>CO-AMOXICLAV 625 (500/125) TAB</td>
<td>TABLET</td>
<td>192,787,095,600</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>CEPHALEXIN 500MG CAP</td>
<td>CAPSULE</td>
<td>180,589,092,480</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>INTERFERON B 1A 30 MCG AMP</td>
<td>VIAL</td>
<td>157,732,300,000</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>OMEPRAZOLE 20MG CAP</td>
<td>CAPSULE</td>
<td>148,454,443,326</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>MYCOPHENOLATE MOFETIL 500MG TAB</td>
<td>TABLET</td>
<td>128,820,389,600</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>RANITIDINE 150MG TAB</td>
<td>TABLET</td>
<td>107,028,292,800</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>CEFAZOLIN 1 GR VIAL</td>
<td>VIAL</td>
<td>105,389,671,000</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>CEFIXIME 100MG/5ML 100ML FOR SUSP</td>
<td>SUSPENSION</td>
<td>98,174,959,300</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>ADULT COLD TAB</td>
<td>TABLET</td>
<td>86,397,287,700</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>DEXAMETHASONE PHOSPHATE DISODIUM 8MG/2ML AMP</td>
<td>AMPOULE</td>
<td>85,404,772,500</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>DEXTROSE NACL 3.33% 0.3% 1L INF P-BOTTLE</td>
<td>INFUSION</td>
<td>84,841,022,894</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>NITROGLYCERIN SR 6.4MG TAB</td>
<td>TABLET</td>
<td>84,560,420,809</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>DOCETAXEL 80MG VIAL</td>
<td>VIAL</td>
<td>84,118,955,000</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>CO-AMOXICLAV 312 (250/62.5) POW SUSP</td>
<td>Powder for</td>
<td>79,065,201,600</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>ERYTHROPOIETIN RECOMBINANT HU 2000 IU/VIAL</td>
<td>VIAL</td>
<td>78,572,536,520</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>TRAMADOL HCL 100MG TAB</td>
<td>TABLET</td>
<td>75,449,273,500</td>
<td></td>
</tr>
</tbody>
</table>

Blue = Antibiotics
Orange = Injectables

Source: MOHME.

Note: Trend arrows mean change in position versus the previous year. Overall values have increased for almost all drugs on this list, reflecting the overall growth of the market.
than because these are indicated, causing potential side effects and increasing the risk of antibiotic resistance development among pathogens. Table 7-3 (above) shows that antibiotics and injectables have a high share in the list of the top 20 drugs used in IR Iran.

The average number of drugs per prescription is 3.4, a relatively high number compared to international standards but in the normal range found in developing country markets. Pharmacies in urban areas have computer systems to log dispensing data and share these with insurance organizations. These data are used to provide feedback to doctors (MSIO), but there is no system of incentives yet that rewards adherence to certain standards. The SSO has developed a prototype model and is making plans in this direction. Practice and experiences, however, are not yet available. The MSIO has introduced penalties for doctors whose prescribing patterns are significantly above average, but annually only one to two percent of doctors are subjected to such a penalty.

Table 7-4 and the chart below show the drug consumption profiles for several European countries compared with IR Iran. Despite its improvements in core health indicators, IR Iran’s drug consumption profile still looks more like a developing country profile, with a high use of anti-infective drugs and relatively low usage of drugs against non-communicable diseases.

### Table 7-4: Drug Consumption Profiles by Selected Countries in the EU (2003) and IR Iran (2003 and 2004)

<table>
<thead>
<tr>
<th></th>
<th>Denmark</th>
<th>Estonia</th>
<th>Finland</th>
<th>Iceland</th>
<th>Latvia</th>
<th>Norway</th>
<th>Sweden</th>
<th>IRAN 2002</th>
<th>IRAN 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>131</td>
<td>64</td>
<td>163</td>
<td>110</td>
<td>180</td>
<td>175</td>
<td>311</td>
<td>112</td>
<td>136</td>
</tr>
<tr>
<td>B</td>
<td>72</td>
<td>40</td>
<td>121</td>
<td>27</td>
<td>3</td>
<td>100</td>
<td>116</td>
<td>45</td>
<td>73</td>
</tr>
<tr>
<td>C</td>
<td>287</td>
<td>171</td>
<td>348</td>
<td>278</td>
<td>169</td>
<td>333</td>
<td>337</td>
<td>54</td>
<td>66</td>
</tr>
<tr>
<td>D</td>
<td>112</td>
<td>91</td>
<td>136</td>
<td>155</td>
<td>6</td>
<td>106</td>
<td>122</td>
<td>64</td>
<td>43</td>
</tr>
<tr>
<td>E</td>
<td>26</td>
<td>10</td>
<td>35</td>
<td>20</td>
<td>11</td>
<td>36</td>
<td>38</td>
<td>30</td>
<td>34</td>
</tr>
<tr>
<td>F</td>
<td>16</td>
<td>15</td>
<td>23</td>
<td>21</td>
<td>38</td>
<td>18</td>
<td>18</td>
<td>41</td>
<td>42</td>
</tr>
<tr>
<td>G</td>
<td>45</td>
<td>40</td>
<td>80</td>
<td>67</td>
<td>55</td>
<td>57</td>
<td>59</td>
<td>23</td>
<td>28</td>
</tr>
<tr>
<td>H</td>
<td>228</td>
<td>57</td>
<td>200</td>
<td>266</td>
<td>90</td>
<td>181</td>
<td>234</td>
<td>49</td>
<td>56</td>
</tr>
<tr>
<td>I</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>J</td>
<td>117</td>
<td>52</td>
<td>121</td>
<td>101</td>
<td>65</td>
<td>162</td>
<td>143</td>
<td>31</td>
<td>36</td>
</tr>
<tr>
<td>L</td>
<td>8</td>
<td>7</td>
<td>13</td>
<td>10</td>
<td>0</td>
<td>17</td>
<td>15</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>1049</td>
<td>549</td>
<td>1249</td>
<td>1062</td>
<td>623</td>
<td>1193</td>
<td>1402</td>
<td>464</td>
<td>531</td>
</tr>
</tbody>
</table>


An analysis by the MOHME assessed the cost implications of IR Iran’s consumption pattern if changed and found that they matched the average of the countries listed in the table above. At current prices, drug spending would increase by a factor of 2.62, leading to a total market of about USD 3 billion. If calculated with average prices from the countries selected here, the increase would be by a factor of 9.17. These numbers show the need to carefully manage the transition to a more open system in the pharmaceutical sector to contain costs and rationalize use.
Patient education on the use of medicines is not widespread. There are no general information materials available in pharmacies. Pharmacists have a financial incentive to sell more expensive drugs. As noted earlier, the availability of import drugs on pharmacy shelves cost about three times as much as local generics. In the case of branded originator drugs, the difference is more than ten times a comparably effective local product. This suggests that prices are strongly influenced by perceptions of quality, not unusual in an international context and found in other countries with similar conditions (for example, Lebanon).

**Conclusions and Recommendations**

Compared to other middle-income countries (MICs), IR Iran has a well developed pharmaceutical policy framework and record of achievements in many areas, including access for the poor and building a capable national industry. The public and private sector have excellent technical specialists, although universities do not yet produce a sufficient number of young pharmacists to cover the entire needs of the sector.

Nevertheless, a number of political and economic factors put pressure on the current system of regulating and managing drugs:

- Ambitions to become a WTO member will lead to obligations that are not compatible with the current level of protection of the national drug industry.
- A growing economy is creating an increasing number of people with higher incomes; they demand a standard of care that cannot be financed for the entire population.
- IR Iran cannot and does not want to isolate itself from scientific progress and the availability of innovative treatments with high efficacy but also high costs.

These developments suggest the necessity of a transition from a policy focused on equal access to a basic standard of care to a policy of a more differentiated nature: maintaining a system that ensures access of
the poor to a good quality basic package of medical care, while at the same time increasing the choices for the wealthier part of the population (i.e., those who are willing to pay extra for convenience or perceived higher standards). It is also important to create conditions that allow the national industry to make the investments and strategic choices necessary for survival in a more open market.

The following key issue areas and issues have been identified in meetings with policy makers and stakeholders in IR Iran..

**Regulation, Administration and Enforcement**

The current situation with a food and drug authority integrated into the MOHME creates a mix of technical and political influences on decisions. Many countries have separated the regulatory from the political function and created a separate administration for food and medicine control. The advantage of such a separation is that political influences can be reduced and technical expertise can develop more rapidly than a ministry’s administrative procedures usually allow.

There is also a potential problem with regulatory independence if decisions on pricing and reimbursement are made or influenced by the same bureaucracy that is the lead for monitoring quality standards. For example, if inspectors report problems with GMP compliance in a factory owned by the SSO, the SSO management could use its influence on the MOHME to reduce the impact of the report and delay necessary investments as a way to maintain low costs. Financing of positions at the MOHME by national pharmaceutical companies adds to the potential lack of regulatory independence.

The pricing mechanism appears to be counter-productive from an industrial policy perspective. Prices are too low by international standards to secure supply with quality generics. Once the market is opened up, it could lead to a price shock for the payment system and at the same time a collapse of the national industry.

The drug selection mechanism by the listing committee has worked relatively well in the past. However, there is a degree of duplication/overlap with the High Council of the insurance funds, and its reimbursement decisions. The listing mechanism is still opinion-based. A more structured and transparent approach is needed.

Given the increasing demand for imported “modern” medicines among the wealthier urban population, the restrictive listing policy together with a lack of control of cross-border trade encourages a grey market with risk of counterfeit entry, inadequate use of medicines, and unnecessary out-of-pocket spending. Long open borders and narcotics trafficking infrastructure create high risk of entry of counterfeit and illicit drugs. There is no specific legislation that allows punishing counterfeiters or distributors of counterfeit drugs according to the severity of the crime. Counterfeit drugs can create severe side effects and can cause death. Inspectors are not routinely taking samples from pharmacy shelves for analysis; capacity for inspections is too low. Law enforcement is not trained to deal with crimes related to medicinal drugs. Finally, the lack of knowledge among general population creates high vulnerability for illicit practices and illegal trade.

The Food and Drug Control Lab will require future investment, mainly in a new building, in order to achieve international Good Laboratory Practice standards. Lab capacity could become a bottleneck for the implementation of other measures.
Industry, Market and Technology

The current pricing mechanism does not create sufficient incentive and income to allow for a modernization of the industry. The present international GMP standards require significant investments that cannot be financed from current cash flow. In addition, the management often focuses on the internal bureaucracy instead of focusing on a longer-term strategy to grow and develop new markets. The relevance of this inadequate management focus can be seen in the ongoing fragmentation of industry and lack of measures to rationalize and save costs. Government interference and conflict of interest at the industry or organization board level may interfere with sound strategic decision making and create problems for the future of companies owned by the SSO. For example, why are there not more imports from low cost producers in nearby India or China? Insurers such as the SSO might better import low cost drugs to save on patient expenditures.

It appears that there is an inadequate culture of accountability (arguably typical for government-controlled industries), and structures have been built to balance influences and satisfy various conflicting political and economic agendas. Existing holding structures mean additional layers of management, and may cause further diffusion of accountability. Performance-oriented management is very difficult in such organizations.

The lack of clear and accountable governance structures may be one reason why foreign investors also shy away from the Iranian market despite its huge potential. The insufficient legal basis for mergers and acquisitions may be a key problem that blocks rationalization and consolidation, even if owners and management would have the intention and political support to implement such measures. The industry may not be competitive with foreign companies in terms of marketing skills, and may not be competitive in an open market. One indicator is that imported products seem to enjoy a significantly higher reputation than domestic ones.

Successful industrial development requires a combination of public investment in science, education, and infrastructure and private investment in applied sciences, product development, manufacturing, and marketing. All success stories for pharmaceutical and biotech industry development have common themes. They emerge from clusters of academic know-how, with core industries competing with each other and attracting talent, and supporting services and smaller businesses that assist the core industry with process and technology innovation. The current fragmentation may prevent the development of such powerful clusters.

Financing, Payment and Utilization

The subsidies for drugs are not well targeted, with upper- and lower-income groups paying the same low prices and co-payment ceiling. Subsidies unnecessarily assist the upper income groups, for whom the cost burden is much less from the standpoint of relative income. Co-payments can be a hurdle for access to more expensive, lifesaving medicines, especially if imported. Poor patients need to provide payments first and be reimbursed only later.

Insurance organizations are “takers” of decisions made by a complex bureaucracy rather than “active purchasers.” They are not using capabilities and financial power to influence providers and derive better value for money. Soft budgeting caps reduce the pressure to increase efficiency in purchasing.

Hospital drug procurement, management, and utilization are not transparent. It appears that some hospitals are reallocating drug budgets to other items and utilizing outpatient prescriptions to supply patients with drugs. Overprescribing, in terms of number of drugs per prescription, use of injections and antibiotics, is a common problem. This creates unnecessary expenses and risks for patients. There appear
to be no instruments in place yet to effectively influence physician’s prescribing behavior, although the SSO has developed a new database for prescribing data. The information is not yet shared or well utilized so far. Sanctions for prescribing outside the drug list appear to be rare or nonexistent.

Overall, even in the richest countries there are many similar problems in the pharmaceutical sector. Many middle-income countries are in a position that is more difficult to reform than IR Iran, either in terms of the current situation, or because they do not have the same level of political integration and technical skills.

**Short- and Medium-Term Priorities for Reform**

A number of activities and policy steps can be envisaged both short-term (one to two years) and medium-term (three to five years) to address some of these challenges. Some of the issues listed above are more of a priority than others, and some are easier to address. Here a stepwise approach to reforming the sector is developed, starting with those measures that are more urgent and also looking for measures that yield political capital and are relatively easy to implement. Issues can be listed separately for the each of the various dimensions such as regulation, market, financing, and utilization. Reform strategies are in many cases, however, a combination of measures that transcend these dimensions.

**Short-Term Recommendations (One to Two Years)**

1) *Foster Industrial Development under More Open Market Conditions.* In terms of urgency and potential impact of failure to reform, the aspect of industrial policy appears to be a high priority at this point in time. IR Iran will need to retain a strong domestic pharmaceutical industry. It will need to act soon to create conditions that allow for an orderly transition from a protected domestically oriented economy to an open market with threats (competition) and opportunities (export, innovation). The following mix of policy measures should be considered:

- Increasing flexibility in pricing policies. For example, it might consider changing from administrative price fixing to tendered prices, with insurance funds as buyers. This should be combined with more price flexibility in the private (noninsured) market, for example by setting relatively generous ceiling prices (for example, at the price of current imports) and allowing price competition under these ceilings.
- Setting clear and non-negotiable targets for GMP compliance for the domestic industry, again over several years to allow adjustment and planning.
- Eliminating (according to a published time schedule) excessive tariffs on imported drugs, in a step by step approach. Having a clear time schedule is critical for the industry.
- Targeted investments in science and education.

In addition, some investments in infrastructure and technology would be beneficial for the development of industry:

- Drug control labs should be upgraded to international level, starting with the national lab in Tehran.
- A specialized venture capital fund should be established for investments into related technologies.
- Existing gaps in the legislation, for example, with regard to mergers and acquisitions, will need to be closed.
Analysis and addressing of barriers for foreign investors. While there may be some political issues not under the control of line ministries, it is very likely that there are additional factors that prevent foreign companies from investing in Iran. Limited entrepreneurial freedom in the generic market may be one, lack of predictability of government policies another. Both can be addressed even under a somewhat restricted geopolitical situation.

**Expected Impacts.** The impact of these policy interventions could be a consolidation of national manufacturers. Stronger ones might acquire and integrate weaker ones. This could save costs and increase economies of scale. It is likely that international manufacturers will play a major role in this consolidation. It is important whether domestic companies can get the capital needed. Mergers or acquisitions require investments, though in the longer term it could lead to savings.

This mix of interventions could have implications on other areas that need to be addressed, including:

- Prices for drugs may increase, at least initially. The government would perhaps need to increase the contribution to the insurance funds, while these reduce co-payments for sensitive drugs and thereby neutralize the impact on the poor and vulnerable groups. Once insurance funds have developed full capacity for procuring drugs under framework contracts in open international tenders, prices may decrease. The remaining cost increase could be offset by sharper measures for management of utilization and controlling overall volume.

- Reimbursement policy would change from one price for all identical drugs with fixed co-payments to a reimbursement ceiling at the level of the tendered, least expensive drug (at some defined level of quality). For the least expensive drug, co-payments could be reduced; if a different brand is chosen, the patient would have to pay the difference out-of-pocket. Such a solution protects the poor and creates choice for the upper-income groups.

- Pharmacists will have incentives to recommend more expensive brands once there is price differentiation. Pharmacy payments for reimbursed drugs may need to be restructured so that there is no incentive for the pharmacists to make the patient pay more than necessary (e.g., flat dispensing fee instead of margin).

- A proactive information campaign could accompany such policy changes and explain these changes and impacts to the general population.

All these measures would require capacity and investments for preparatory analysis, modeling, and planning.

2) **Improve Hospital Drug Procurement and Utilization Policies.** The first step would be a study to analyze in more depth the current situation in terms of:

- Availability of drugs;
- Procurement methods and prices paid; and
- Drug utilization, formularies, and rational use.

This problem might only be solved in the context of a reform of hospital financing and payment, discussed in Section 6. Nevertheless, the first step is to initiate a system analysis. There may be short-term measures that could be put in place to mitigate the impact on patients and payers.

3) **Address the Issues of Counterfeit and Substandard Drugs.** Anecdotal reports show structural weaknesses that benefit counterfeiters, and make it likely that the problem could become more serious over time. A small study is now underway to assess the prevalence of counterfeit drugs. Even before
the study is final, steps can be taken to limit the risk for patients and increase the risk for counterfeiters:

- Undermine and ultimately eliminate the “grey market” by providing easier access to the Iranian market for drugs that are licensed in the United States or the European Union. The main barrier should be the reimbursement list, not registration. This does not suggest total abolishment of the current model. A change in the exception model alone would make it easier for doctors to prescribe unlisted drugs and reduce the market price, effectively eliminating price differentials with grey market importers. This could be combined with heavy fines for illegal imports and stricter controls.

- Making or selling counterfeit drugs should become a separate criminal offense, not covered by the paragraph that addresses trade in unlicensed medicines. Importers who sell drugs that can cause harm to patients should be held personally accountable if the drug is not registered in IR Iran. Severe cases, for example selling counterfeits of lifesaving drugs, should lead to severe punishment.

- Law enforcement and judiciary should be trained to understand the issue of drug counterfeiting, and set up special units to deal with severe cases.

- Doctors and pharmacists need to be sensitized and should have a channel to report suspicious observations.

- The general public should be informed about the danger of buying unlisted drugs, or even buying drugs of unclear origin in street markets, fitness studios, or other places.

Medium-Term Recommendations (Three to Five Years)

In the medium term, the following recommendations might be considered:

1) Separate Regulation and Technical Administration, by creating an independent food and drug authority.

2) Increase Capacity for Inspections and introduce a more proactive market surveillance (taking and analyzing samples from pharmacy shelves).

3) Strengthen and Expand Programs for Public Education on rational drug use.

4) Strengthen MIS Systems in the insurance funds organizations, using/expanding existing IT systems and developing an integrated real time monitoring system for rational drug use open to all insurers and the MOHME.

5) Improve Physician Prescribing Behaviors. Use existing data to start developing specific measures for influencing physician’s prescribing behavior (education, “academic detailing,” incentives based on adherence to rules). Once a new integrated information system is operational, it can be developed over time to higher levels of sophistication for profiling and rejecting claims for unnecessary prescriptions and overutilization.

6) End Soft Budget Caps. Measures should be developed to increase accountability for insurance managers for budget adherence instead of automatic budget relief or bail out at the end of the fiscal year.

Transformation Process and Management

The suggested changes are complex and require coordinated efforts between several ministries and stakeholders. The political risks may be significant, in particular if measures are implemented without
sufficient communication for the general public. It may be necessary to start the process with a few decisions that put pressure on stakeholders. However, over time, more in-depth analysis and impact modeling of the industry will be needed. Once a strategy has been drafted, most likely by some form of interministerial expert group, an ongoing consultation process is recommended. Expertise and capacity will be needed in the pharmaceutical sector to support analysis, planning, consultation and implementation.
Section 8
Health Management Information Systems

Introduction and Overview

Rationale and Motivation

The Iranian health sector will face enormous strains and pressures in the years to come as previous sections have pointed out along several dimensions. Like other countries, it will grapple with how best to utilize its health care resources to benefit the most people in an attempt to meet ever-growing expectations and virtually unlimited demand.

Box 8-1: Summary Points

The Iranian health system has enormous opportunities to benefit from the development of an integrated Health Management Information System (HMIS), which would underpin all the essential administrative and clinical operations in a modern health financing and health care delivery systems.

The government will need to play a key role in regulating the development of common IT and MIS standards to ensure inter-operability among different users and beneficiaries. In particular, in the areas of disease surveillance and public health monitoring, a national HMIS would be required to monitor health indicators across Iran on a timely basis. This would also include the participation of the private health sector in the development of common HMIS standards and procedures.

The development of a national HMIS will require conditions such as the availability of inexpensive, ubiquitous, and reliable telecommunications; a sufficient “pipeline” of new student talent; strong enforcement of intellectual property rights (lack of which impedes companies from investing in HMIS software development); robust and comprehensive health information standards; an overall coordinating “hub” or “center” for HMIS coordination and development; and cooperation and involvement from the private health sector.

Health Management Information Systems (HMIS) have become one of the more potent tools to foster and indeed “drive” improvement in the sector. HMIS can impact all four performance dimensions of health services delivery improvement, namely:

- Access
- Equity
- Efficiency
- Quality.

This Health Sector Review has detailed some known access problems in IR Iran, especially in its newly sprawling urban areas as well as some of its remote rural areas. Issues of equity have been documented (see, for example, Lankarine 2006; Farvardine 2006). Section 7 on Financing showed that cost-efficiency and productivity can be improved and indeed a more comprehensive HMIS would play an integral part in the process. Finally, there are substantial quality issues, and Article 29 of the Constitution and the Twenty Year Vision of the Islamic Republic specifically call for attention to issues of health services and health care quality.
Each of these dimensions can be positively affected by a well designed and applied set of HMIS techniques and tools. The health industry generally lags far behind other information-intense industries in understanding the benefits of building complex automated processes. The need for greater attention to and investment in HMIS becomes acute as health finance and delivery models change and as policy makers focus on improvements in utilization and quality. The IR Iran is considering or initiating reforms in all of these areas. There is ample evidence in the world that HMIS can be an enabler to these changes.

The Islamic Republic of Iran has the technological prowess and economic means to be a world leader in the application of HMIS to its health sector. This opportunity is particularly poignant at this moment as health care costs increase and health information systems costs decrease.

What can propel IR Iran to the next level of technical achievement in HMIS? What interventions may be needed? What further investment may be needed? These are the subjects of this section.

**Experience and Accomplishments**

The Islamic Republic of Iran has a long and distinguished history in its efforts to improve the flow of health management information. Thus, IR Iran is certainly not starting from scratch in its HMIS activities. Among its many accomplishments to date is:

1. The creation of the vital horoscope which shows on just one page the overall health status of a village (see, for example, Shadpour 1995). The vital horoscope is prominently displayed in health houses across IR Iran and is recognized around the world as an important contribution to public health. The vital horoscope improves and simplifies reporting from health houses throughout the country as was outlined in Sections 3 and 4;

2. The use of computerized systems in its social insurance agencies (Social Security Organization (SSO) and the Medical Services Insurance Organization (MSIO)) dates back several decades, predating the revolution. Considerable emphasis has been put into continually improving the systems;

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26 This author has seen that the vital horoscope has been adopted in other countries as well. Most recently it was seen on a visit to western China.
3. The implementation of Hospital Information Systems and other patient care-based systems were successfully accomplished in a number of health care venues. At some hospitals, information systems are advanced;

**Figure 8-2: “Digital Hospital” in Shahrud (2002)**

4. Academic programs to train professionals in HMIS are emerging and graduating future leaders. The fact that the MOHME can influence and direct medical education to include some aspects of computer literacy and help create an “information culture” among young doctors gives it an advantage;

5. A number of private enterprises are emerging that are poised to address the need for “off the shelf” software for the health sector. While capacity in software development has not yet reached the levels present in Dubai or Bangalore, it is growing rapidly.

Given this considerable experience, HMIS are well established and understood in many agencies of the health care delivery system and in health finance in IR Iran. Both clinicians and administrative personnel share an understanding of the need for these systems and seem receptive to further development.

**Characteristics of the Next Level of HMIS Development**

It will be useful first to understand the characteristics of the next level of HMIS development:

1. **Pinpointing and focusing the use of HMIS to address specific strategic issues** in the health sector. Since it is never possible to “finish” an HMIS, indeed it contiguous, identifying those areas that are most amenable to computer assistance and focusing on these will be an important aspect of being able to move forward.

2. Integrating and unifying the existing HMIS systems (and new ones) into a more *integrated “health network.”* While no country has achieved “full” integration, the need to push more of the pieces together into an orchestrated whole will create new synergies from IR Iran’s HMIS investments.
3. **Retooling its retrospective health data collection** to be more responsive and to provide a richer reservoir of information for decision making. While generally a lot of retrospective health data is available in IR Iran, it suffers from questions of timeliness and completeness.\(^{27}\)

4. More **widely deploying HMIS** to IR Iran’s health venues and health agencies.

**Obstacles to Further Development – Capacity and Infrastructure Issues**

The progression from an era of more limited, stand alone, and bottom up development to an era of integration and top down strategy is not an easy one. IR Iran faces the following obstacles when moving ahead in its HMIS development:

1. **IR Iran lacks cheap, reliable, and ubiquitous Internet connection.** The results have been a rather low penetration of Internet users. Slightly less than 10 percent of the Iranian population is currently online.\(^{28}\) The average for the entire world is currently estimated at 10.3 percent.

2. **IR Iran lacks a sufficiently robust pipeline for new student talent in computer science** (and related disciplines). According to the statistics provided, there were 160 graduates at the Bachelor of Science (149) and Masters of Science (11) level in 2005. Given that some of these graduates might find work elsewhere (Dubai remains a large magnet for new graduates), this number will need to be increased in the future if IR Iran wishes to develop its MIS and HMIS industries quickly. Specifically, training in advanced software development, software engineering, and large scale project management will be very much needed in the future.

3. **IR Iran lacks strong enforcement of its intellectual property rights laws.** The lack of strong enforcement dampens the incentive of local industry to create innovative new software for the health sector, since the risks of losing one’s intellectual property offsets the high risk of large capital investment.

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\(^{27}\) The WHO Iran Health Sector Profile study (December 2006) talks about issues in data quality and the continuous use of HMIS data.

\(^{28}\) In 2004, 6.6 millions Iranians were Internet users. This compares to 8 percent for Indonesia, 17 percent for Brazil, and 10 percent for China. See: [http://www.internetworldstats.com/top20.htm](http://www.internetworldstats.com/top20.htm).
Obstacles to Further Development – Health Sector Issues

Notwithstanding IR Iran’s laudable efforts to date in HMIS development, significant gaps in its experience remain challenges to move forward with more advanced HMIS development:

1. Perhaps most important is a lack of robust and comprehensive standards upon which the interoperability of HMIS systems could be based. This lack of standards limits the synergy that could result from the operation of its HMIS systems. It is reported that most systems in use are stand-alone and are not integrated into a larger network of systems.

2. IR Iran lacks a coordination “hub” or “center” for HMIS efforts in MOHME and, more generally, in the health sector as a whole. This is a serious impediment. Without a central focus and central coordinating body, the complex and sophisticated systems that will be needed in the future will be impossible to design, manage, or support. While MOHME has a relatively large pool of IT specialists (314), synergy of their output will never be realized unless there is a more coordinated, orchestrated, overall activity. Many “islands of experts” are at work in their respective agencies and organizations, but with little coordination currently.

3. Involvement with and cooperation from the private health care delivery sector is lacking, so valuable information from an increasingly large proportion of health interventions is not being captured.

Addressing these infrastructure and health sector-related factors will help IR Iran to more fully employ HMIS in the improvement of its health sector.

Current Environment for the Development of the HMIS

Estimates of current HMIS development in the country are provided below.

1. The use of computerized systems in its social insurance agencies (e.g., SSO and MSIO) has triggered emphasis on continually improving the systems. Considerable expertise exists, especially at the SSO, but capacity there will be exceeded as IR Iran implements new, complex financing schemes.

2. Percentage of public primary care clinics with a Clinic Information System. Coverage of its existing HMIS is varied. According to estimates, only 60–70 percent of the population is covered in its primary care statistics. While information is available from nearly 100 percent of the rural health centers, the situation in the cities is far different.

3. Percentage of private primary care clinics with a Clinic Information System. This has been estimated at approximately 30 percent, existing in outpatient departments of private hospitals or in medical offices (cabinets) of independent private providers.

4. Percentage of public hospitals with a Hospital Information System. This has been estimated at approximately 20 percent. Most/all of these are stand alone systems.

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29 This observation is reported by many national and international observers and is highlighted in Azim (2006).
30 The exact size of Iran’s private health sector today is not accurately known.
31 Ibid.
32 These data are reported by Dr. Seifollahi, and based on an observation shared by the Office of Research and Development, MOHME, in 2006.
5. Percentage of private hospitals with a Hospital Information System. This has been estimated at approximately 40 percent. Most/all of these are stand alone systems.

**Figure 8-4: Estimates of HMIS Penetration in Iranian Health Settings**

![Graph showing HMIS penetration](image)


The penetration of HMIS systems in health settings across IR Iran, thus, remains relatively low. A modern health care delivery system and a modern health finance system will require investment in an equally modern HMIS to be deployed widely across the country in its health settings and in its health finance organizations.

**Areas of Further HMIS Developments**

HMIS can streamline and improve health care processes and institutions. There remain significant opportunities for IR Iran to pursue further development of HMIS in each of the seven application areas of HMIS as outlined in Figure 8-6.

**Figure 8-5: HMIS Application Areas**

<table>
<thead>
<tr>
<th>CLINICAL APPLICATIONS</th>
<th>ADMINISTRATIVE APPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Disease State Management</td>
<td>6. Financial Management</td>
</tr>
<tr>
<td></td>
<td>7. Quality Management</td>
</tr>
</tbody>
</table>

Conclusions and Recommendations

There appears to be little dispute about the need to continue building a comprehensive HMIS for IR Iran nor is there much doubt about the current status of HMIS systems. Most parties agree these issues. The real questions become: How does the sector achieve this vision? How long will it take? What is the best path? How much will it cost? Where does the sector begin?

While not all of these questions can be answered satisfactorily at this point, this section attempts to give some guidance, based on international experience and on observation of the attempts by many countries to build a comparable HMIS.

To aid in this discussion, recommendations will be broken into ongoing policy recommendations, then recommendations addressing short-term activities (one to two years), and concluding with medium-term (three to five years) activities.

Policy Recommendations (Current and Ongoing)

Policy decisions and actions are always at the center of health care reform. So it is with HMIS expansion and sophistication.

1) **Cooperation of the Private Health Sector.** Except for reporting of certain infectious diseases, little data currently emerges from the private health sector. This data deficit means that a considerable proportion of health interventions are not accounted for in the overall national statistics.

   It is important to actively engage representatives from the private health sector when deciding national health information standards. Involving the private sector in these discussions and decisions may elicit more cooperation and a sense of ownership which would help sustain the efforts later. It is important not to make the reporting requirement too onerous or expensive. Ideally, once computerized, the information should flow as a normal (and more or less automatic) byproduct of the operation of the system in place at the health venue.

2) **Robust Enforcement of Intellectual Property Rights Laws.** Software development occurs best in an environment where creativity is encouraged and safeguarded. New software development is a risky enterprise involving a large capital investment cost for the design and development efforts which must be recouped and amortized over many sales. Without the assurance that the investment in intellectual property is safeguarded, firms are reluctant to risk the requisite–considerable–capital. At present there appears to be an active private sector in software development but much of their efforts are contracted as “one of a kind” (sometimes called “custom”) development. The advantage of HMIS is that its products can be built once and used many times. This kind of commercial scale development is not yet occurring presumably because it is viewed as too risky by potential investors. Strengthening the enforcement of intellectual property laws might ameliorate this situation.

3) **Encourage Wider Deployment of Best Practices for HMIS.** There are many opportunities to share HMIS software and know-how among health venues and organizations. Once a “good system” is identified, it can be replicated and installed in other places. This should be done as quickly as

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33 An ideal situation would be, for example, for the specification of an (electronic) discharge summary to be produced for each hospital admission in the country, and ultimately for a brief (electronic) encounter summary to be produced for clinic visit, whether the encounter occurred in the public or private sectors. These two “unit records,” the EDS (electronic discharge summary) and the EES (electronic encounter summary) would be a rich new source of retrospective data on health from which utilization, financial, and certain quality measures could be extracted.

34 In computer science, the phrase is “build once, use many times”!
possible, because the useful life of HMIS systems is relatively short. Delays will hurt the ability to maximize the benefit to be enjoyed from further deployment. Besides sharing software, there are many other ways to share expertise and collaborate.

4) **Address the Need for Increased Human Capacity in HMIS.** Success in future HMIS development will depend largely on the human capacity of the country in this field, and the degree to which the pipeline of knowledgeable people in the field is expanded. This involves university and technical training of the technologists and software architects. Beyond the technical trades, increased opportunities for advanced degrees in health informatics will also increase the number of leaders in that domain.

Continual training (and retraining) of the end users of HMIS technology is crucial. Computer literacy among health workers and managers in the world lags that of many other industries. This deficit will need to be reduced if we are to find eager users of more sophisticated HMIS systems in the future.

5) **Retool Current Retrospective Health Data Collection Process to Be More Responsive and More Timely for Decision Making.** The current model for retrospective health data collection involves the aggregation and passing of data upward through various hierarchical levels. This model was the only practical methodology in previous eras but, using current technologies, there is the possibility of rethinking this approach. The chief disadvantage of the current approach is that aggregation “throws away” access to valuable detail along the way, and minimizes one’s ability to “drill down” to that detail later.

It is possible to promote decentralized decision making and still employ centralized data collection. The physical location of the data is not so important. Regardless of where the data are collected, the goal is to make appropriate data available to decision makers at the lower levels. So it is with HMIS—a data warehouse or health data repository in one location (or in a small number of locations in the Republic) could be accessed from many locations.

There are clearly political considerations involved in making such technological changes, but the potential improvements in the timeliness and quality of data collected, the methods by which these data can be presented, and the cost of the support of such activities can be improved through the dismantling of the hierarchical approach.

**Short-Term Recommendations (One to Two Years)**

The next two years will be formative. It would see the building of the requisite institutions and the accomplishment of foundational work in anticipation of a bigger “push” in Years Three to Five.

1) **Establish an Institute of Health Informatics.** All countries grapple with how the regulations and standards will be put in place in order to support a complex HMIS. Some countries place this function squarely within the Ministry of Health, while others prefer it to be more free standing and therefore, theoretically, more able to negotiate among various stakeholders (e.g., provider, payer, and regulator).

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35 A well-designed HMIS system may have a useful life of five to seven years. After that time, even the most venerable workhorse system will become obsolete and the costs to maintain and support it will quickly rise. That is not to say that the original investment is lost after that time, for the next version of the system will learn from, and will likely be based on, the functionality of its predecessors.

36 For example, today it makes little difference where a website exists. Its servers might exist in India or Dubai or wherever; all that is needed is secure and reliable access to its contents.
This “institute” need not be a free standing organization but can be considered a “virtual” organization with perhaps only one full time director and a small clerical and administrative staff. The other members of the institute can serve part time, having been borrowed from other organizations.

The correct choice for IR Iran is not so clear and several options should be explored. Involvement of the nation’s medical schools would be desirable, especially Iran University of Medical Sciences and Health Sciences. Involvement of the medical societies, hospital societies as stakeholders is important. Involvement of the private sector will be crucial to its success as well.

It would be helpful if the institute could be housed in a small space outside the campus of the MOHME to give it more political autonomy, but this is not essential.

2) The Iranian National Health Data Dictionary (INHDD). The first task of this new institute would be to work on national health information standards which will eventually become the INHDD.

National health information standards will need to be significantly strengthened so that HMIS applications will be able to “talk to each other”. Currently, some segments of the needed health information standards exist. It would be helpful to gather all existing standards in one place, and to continue further work toward creating a coherent and comprehensive set of standards. Since this work will require perhaps one year (or more) to complete, it is recommended that a concerted effort to strengthen the existing standards, to identify the gaps in the existing standards and to organize this work so that it will ultimately be collected in one (online?) document could begin as soon as possible.

The INHDD, once completed, validated and adopted, would be shared by all appropriate agencies and organizations. The MOHME would promote and, where necessary, enforce its use across the health sector. All new applications of HMIS would need to conform to the HMIS so as to facilitate interoperability and close integration.

3) A National Health Information Infrastructure. Besides the completion of a Health Data Dictionary, certain health information infrastructure standards need to be developed and adopted. These infrastructure standards would help assure a higher degree of interoperability among components. A more fully developed health information infrastructure standard will have the added benefit of reducing support and training costs later.

4) Center for HMIS Coordination and Integration. It is normal for a country to build its HMIS from the “bottom up” as free standing modules. However, at some point, this “bottom up” model reaches the limits of its ability to support a more complex HMIS because integration of stand alone modules becomes impossible. Somewhere “the big picture” needs to exist about how all the pieces of the HMIS puzzle will fit together.

37 The students and faculty of management at that university could play a pivotal role in helping organize the work of the activities outlined in this document.
38 A good example of a similar institute which involves all stakeholders yet is somewhat autonomous from the stakeholders exists in the Republic of Slovenia (former Yugoslavia) which their Health Informatics Institute is mostly free-standing and enjoys the support and involvement of academicians as well as civil servants.
39 There are a number of examples of existing “dictionaries” created in other countries, and these might suggest a starting point for the accelerated work in Iran. The easiest way to peruse these existing dictionaries is to “google” “national health data dictionary”. The dictionaries of Canada and Australia are particularly well known around the world.
40 The correct technical name for this activity is the creation of an Iranian National Health Data Dictionary and Data Model.
The earlier short-term recommendations, while essential, are not sufficient to create a central office that focuses on the strategic vision and manages the large HMIS projects which will follow.

This new organization might involve combining certain of the existing pieces, specifically the office of the Director General for Statistics and Health Information (DGSHI) and the several other offices within the MOHME, which are currently and independently involved in software development efforts.  

Box 8-2: The Fundamental Problem with the Existing HMIS System

The most significant issue with the existing HMIS is that it aggregates data early in the collection process and throws away detail data early in the aggregation process. Thus, the detail data is lost (or, at least, not easily accessible) making ad hoc investigations of these data all but impossible.

The Center would focus on preserving precious health information and making it available to all authorized individuals in the MOHME and at the health universities so that it can be accessed and used optimally.

The Center would create and monitor an HMIS Strategic Plan, which becomes an overall plan for future HMIS investment. It creates a vision of the “big picture” of overall HMIS development. It attempts to reach a consensus about HMIS priorities and then creates an overall projected timeline for HMIS development;

The Center would have overall responsibility for ongoing training, support and maintenance of the HMIS equipment, for coordinating updates to software when new versions are produced, and for budgeting sufficient monies for supplies and other expendables to assure the ongoing sustainability of the systems.

The creation of this Center can be a first step toward creating a health information system that is responsive to the needs of decision makers throughout the sector.

5) Design of a National Hospital Information System. Once the dictionary and infrastructures standards are completed and agreed to, the design efforts for the HMIS components can begin in earnest. Perhaps the most urgent issue would be to design a Hospital Information System (HIS) to serve the large, urban, public hospitals. While there is automation in these hospitals, they follow no national standard and applications are fragmented and (mostly) disconnected.

Fortunately, there is much experience in IR Iran, and in the world, regarding the design of these hospital-based systems, so such an effort could be completed within one year. The key tenets of such a design would be to:

- serve the operational needs of the host hospital;
- supply retrospective data as an output from that operation; while
- following a national health information standard.

6) Design of a National Health Information Network. Information exchange today uses several means of transport – paper, diskette, email, file transfer… A national health network linking all provinces

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41 Some countries have named this organization as its “Health Informatics Institute”, or “Advanced Technology Laboratory” or “HMIS Coordination Unit”.
with Tehran and providing easy transport of data from the venues to the MOHME would facilitate data transfer, improve timeliness of data, and perhaps also avoid the common transposition errors made today during aggregation of data. Most importantly such a network would obviate the need for aggregation of data as it passes from the venues through the administrative districts and on to Tehran. Thus detailed health data could be preserved for later analysis. While telecommunications costs are still high in IR Iran (relative to many other countries), major links to the provincial centers should now be feasible and justifiable. Certainly in a few years more links to lower level centers will likely also be possible.

Integration is the key to unlocking the synergy between HMIS applications. For example, a modern hospital information system might contain components which interlock with the laboratory information system, interface with a national drug inventory system and communicate eligibility requests to a health insurance system.

No country in the world has yet achieved a totally integrated HMIS system on a large scale. All countries strive to increase integration and unity among its HMIS components. Even more advanced industries (in terms of the use of informatics) such as banking and finance still struggle as well with the challenge of full integration. In health, there are many obvious opportunities to benefit from more integration, and thus to add considerably more efficiency and power. Globally, the world is increasingly interconnected; harnessing computers together across countries also has an impact. This has diminished the attractiveness of stand alone computers and applications.

There are techniques that limit the cost of interconnection. Not all systems need to be “online” with each other at all times. For example, database replication is one way to easily, and more inexpensively, move data. Replication can be used in remote and semi-rural areas where the cost or reliability of telecommunications remains problematic.

On a broader scale, the Government of the Islamic Republic of Iran could consider building a government wide Intranet over which traffic from multiple ministries could travel. This has proven to be feasible and desirable in some countries and is far cheaper and easier to manage than for every ministry to build its own. However, in some countries this idea has been difficult to implement because of interministerial competitiveness.

42 There are examples of significant health networking in Iran. Perhaps the largest such network is being created by the SSO, linking its branches to its headquarters. This network might be shared with other health agencies at some point.

43 The Kingdom of Bahrain is one such example where the national governmental network has met with considerable success. It is not clear however whether this example is pertinent to Iran which is many times larger than Bahrain.
Medium-Term Recommendations (Three to Five Years)

Assuming the foundational activities described above were completed and that the new institutions were created and in place, it might be possible to develop a rather large number of complex application systems in a relatively short period of time.

The applications need not be created by the government agencies themselves but instead the Center (see Short-Term Recommendation No. 4) would oversee and monitor activities that were outsourced to the private sector. This would both encourage growth of the private sector and also allow multiple systems to be developed simultaneously.

1) Procurement and Implementation of a Financial Management Information System (FMIS). In order for IR Iran to meet its objectives of stimulating primary care, rationalizing hospital beds, evaluation medical technologies and generally allowing a smooth functioning of the health system, it is imperative that it have access to a comprehensive, modern FMIS.

An FMIS includes these functional areas:

- Budgeting and budget monitoring;
- Human resources, personnel management, payroll;
- Inventory and inventory control – of medical supplies, drugs, etc.;
- Accounting functions including: accounts receivable and accounts payable;

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The private sector may be far better equipped to do software development than are governmental agencies. However, it is crucial that the governmental agencies exist so that they can direct and govern the design. It is not unlike the division of duties between an architect and a general contractor when building a large building. Both are necessary. Neither can (easily) do the other’s tasks.
• Fixed asset management; and,
• General Ledger;

The General Ledger, based on national health accounts, would give financial information to the decision makers while allowing an interface to the governmental accounting system.\textsuperscript{45}

It is unlikely that an FMIS would need to be developed, because many there are existing FMIS that could be used as the basis for IR Iran’s FMIS. The steps to creating the FMIS are:

a) Requirements study;
b) Technical specification;
c) Procurement;
d) Customization and language localization to Farsi;
e) Implementation; and,
f) Optimization.

2) \textit{Procurement and Implementation of the National Hospital Information System (HIS)}. In the earlier steps, the concept of a national system that could be deployed in many hospitals across IR Iran was suggested, and the design of such a system undertaken (Short-Term Recommendation No. 5). Only when this design is completed would it be clear whether a new system should be designed, or whether an existing system could be used as the basis for that design.\textsuperscript{46} In any case it will be important to assure that the “new” system is totally compliant with IR Iran’s new health dictionary so that the system communicates easily with other systems in the future.\textsuperscript{47}

An early use of the Health Information Network might be to route referrals, and abstracts of clinical information for the patients being referred, among hospitals in a catchment area.

3) \textit{New Payer Information System for SSO, MSIO}. In the past, IR Iran’s national payers have needed to exercise only limited discretion. They have not had to make detailed judgments about utilization norms or quality measures. They have experience contracting with providers, but they have not had to formally negotiate those contracts in order to get the lowest possible cost.

Since the payer is subjected to more scrutiny and since the role of the payer will inevitably grow, a more complex Payer Information System will be needed in order for the payers to do their job. One can think of a health insurance system as being composed of three distinct components. As outlined in Figure 8-8.

\textsuperscript{45} Most countries have found that, despite the existence of a government-wide accounting system, that an FMIS is still needed within the MOHME so that it can better manage the business affairs of its business units.

\textsuperscript{46} Indeed the earlier work on the pilot of “Iran’s First Digital Hospital” in Shahrud could possibly become the basis for further development.

\textsuperscript{47} Some examples of the need for communication – for referrals to other health venues, for utilization reporting to payers such as SSO and MSI.
The Payer Information System will address Component No. 1 in the diagram above. The procurement and implementation of a national HIS (see Medium-Term Recommendation No. 2) will begin to address component number 3 in the diagram above. Component No. 3 will be addressed in activity short-term recommendation 6 above, thus completing the loop.

An example of the kind of functionality that will be needed might be illustrative here. The ever-increasing cost of prescription drugs is a concern in IR Iran (as outlined in Section 8). Representing an ever larger share of health care expenditures, this one cost threatens to swing “out of control” in many countries.

At the Social Security Organization (SSO), the average cost of a prescription from a contracted provider is approximately Rls 20,000, while the average cost of a prescription from a noncontracted provider is more than Rls 100,000 (Figure 8-9). Some differences due to specialty and other factors may account for much of the 500 percent variation, but likely cannot explain all the variance.
Figure 8-8: SSO Average Costs per Prescription for Contracted Physicians (left) Versus Noncontracted Physicians (right) Latest Two Years

The HMIS might be employed to more fully track prescribing behaviors and to look for patterns of inefficiency. Similarly, the HMIS could be used to evaluate appropriate incentives to be offered to physicians who enter into appropriate contracts with the social insurance agencies and who abide by prescribing guidelines.

The need to continue development of IR Iran’s Payer Information System will of course continue indefinitely. As finance schemes change, as new legislation regarding universal coverage or regarding covered populations emerge, these changes will inevitably impact the design of the Payer System.

4) The next Clinic Information System (CIS). The vital horoscope was a breakthrough and perfect for its time. As IR Iran progresses, and certainly by the year 2012, at the end of the period being explored in this report, a new Clinic Information System will be needed which is far more automated than the current paper-based method.

It is difficult to predict IR Iran’s, or the world’s, MIS environment within five years, but probably significantly far more advanced than currently. All clinics, except perhaps the most remote health houses, will likely be “on the network” by then, and therefore a clinic application which utilizes that network will be a very considerable advance. In the interim, it would be advisable to roll out the new CIS within IR Iran’s urban clinics, which today face the largest information deficit.

IR Iran may choose to base its next Clinic Information System on its design of the vital horoscope. Instead of aggregate data and statistics, it will be possible to capture most (if not all) of the underlying detail data as well. This will provide a far richer source of data analysis for decision making in the future.

48 Canada’s provincial payers, such as MediPlan in the province of British Columbia, has continued to work perfecting its payer system now over several decades.
### Figure 8-9: Gantt Chart for Longer-Term Activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1. Financial Management Information System</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>L2. National Hospital Information System</td>
<td></td>
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</tr>
<tr>
<td>L3. Payer Information System</td>
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<td></td>
<td></td>
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<tr>
<td>L4. Clinic Information System</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 9
Health Resources Policy

Human Resources (HR) and HR policies are critical inputs to the performance of the health sector. Changes in HR policies do not always affect sector performance in the short run. Medical curricula changes and educational reforms may take time to implement, and it may take time to effectively train and produce different types and levels of providers. Nevertheless, HR reforms are an integral part of any changes in medium-term reforms and must play a part in any system design changes.

Box 9-1: Summary Points

The number of physicians per population in the Islamic Republic of Iran (IR Iran) has increased at a much higher rate than other health workers in IR Iran.

Physician unemployment is an issue, especially for the younger, newly graduated physicians in the urban areas. Most doctors (84 percent) reside in urban areas where there is competition for few available positions, given the limited absorptive capacity of the MOHME for new physicians.

Increasing specialization and upgrading of skills of health care workers, especially doctors, has become an alarming trend, given the changing demographics and epidemiologic profile.

IR Iran needs a human resource strategy and planning to ensure that the number and skill mix of available health workers matches the current and projected demand. There is no clear evidence of demonstrated linkages between projected human resource needs and intake into medical or nursing schools.

Medical curricula are also in need of modernization. The current curriculum focuses mainly on the specialized curative service; less attention and focus has been on preventive, chronic care management, palliative, and inter-professional fields. The medical curricula requires overhaul to a model that is more student-centered, problem-based, and system-centered.

Sections 2, 3, and 4 discussed that the bedrock of IR Iran’s highly acclaimed primary health care system is the health care worker, in particular, the behvarz, whose introduction was a critical contributor to the primary health care system’s success. As IR Iran now faces new challenges in demographics and epidemiologic profile, health workers at every level, (i.e., primary care, hospitals, and other care delivery settings) will play a critical role in the future of IR Iran’s health care sector. Leadership will no doubt continue to assess and reassess adequacy of the current workforce and HR policies in the context of new challenges ahead.

The section begins with trends in the health sector workforce, and then reviews public and private employment patterns. Distribution and the maldistribution in urban versus rural regions are the next topic of discussion, comparing the numbers of doctors and nurses relative to other countries in the region and globally. Finally, the section looks at training programs and human resources policies and the need for reform.

Trends in Health Sector Workforce

In 2005, the Iranian public sector for health and health care employed 291,500 persons. Of these, around 24,700 were physicians, 151,200 paramedical professionals (including nurses, midwives, and health workers), and 115,600 other workers (SCI 2006) (Figure 9-1). Furthermore, 58,000 health volunteers
work at the PHC level to promote public health and family planning activities to a population of around 13 million persons.

The total number of doctors working in the health sector, including the private sector, the army health units, and networks managed by other ministries and State organizations, is estimated to exceed 60,000 (Malek Zadeh et al. 2001). In addition, anecdotal evidence (discussed in Sections 4, 5, and 6) shows that many of the MOHME physicians maintain a private practices as a second job to compensate the low salary provided by the MOHME. This dual employment practice makes it difficult to calculate the number of physicians in the entire country.

**Figure 9-1: Numbers of Health Sector Workers Employed by MOHME**

The cumulative number of medical doctors in IR Iran has been increasing significantly each year, in rough parallel with the increasing trend in the number of health establishments and beds (Figure 9-2). As with beds, there has been a pronounced upturn in doctors this decade. Between 1986 and 2004, the number of physicians employed by the MOHME increased from 10,944 to 24,661. However, this increase has been skewed toward the production of specialists. For instance, among physicians, the ratio of specialists to general practitioners employed by the MOHME has increased over the last 15 years from about 0.7 per 1,000 populations in 1990 to 1.0 per 1,000 in 2005, as illustrated in Figure 9-3.49

According to the 2005 data provided by the MOHME, the most common types of specialists its employed are OB/GYN, anesthesiology, pediatrics, general surgery, and internal medicine, the last of which accounts in total for nearly 20 percent of the MOHME specialists. The increase in specialization among physicians may be a response to market signals such as the levels of income across specialties and formal provider payment systems in place, which provide more generous reimbursement for specialist care and services as discussed in Section 7.

The majority of medical doctors employed by the MOHME reside in urban areas. Available data from the MOHME indicate that 84 percent of MOHME physicians reside in urban areas whereas only 13 percent reside in rural areas (3 percent were categorized as unknown). If compared with the proportion of the Iranian population living in rural areas, 33 percent, it is evident that MOHME physicians are

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49 Specialists here exclude dentists, pharmacists, and veterinarian.
disproportionally located in urban areas. Disparity in availability of MOHME physicians also exists across provinces. For example, the number of MOHME physician per 1,000 population in Ilam was only 0.23, on the contrary, the ratio was 0.72 in Semnan, more than three times of Ilam. Data is unavailable regarding the distribution of specialists and GPs by rural and urban dwelling.

Addressing maldistribution issues is multidimensional. Section 4, for example, discussed incentives and incomes. The new rural health insurance program has developed new models of housing support and improved incomes and bonus schemes for rural physicians, especially primary care physicians. Real income levels, including both formal and informal streams of revenues, as well as the opportunity cost of moving to a rural location, for rural GPs must be competitive with urban specialists if longer-term redistribution of physicians is to occur. Financial incentives will need to be complemented by curriculum reforms, preferential consideration for medical school admissions, and postgraduate training programs as well.

Figure 9-4 illustrates the trend in the number of other health workers in IR Iran. In general, other types of workers in the health sector have leveled off in this decade. Only physicians appear to be increasing at significant levels.

Nursing is now recognized as a profession in IR Iran. There are two levels of nurses with qualification to practice: (i) registered nurses and (ii) nurse auxiliaries. Efforts are being made to promote the image of nursing and empower nurses relative to other health professionals in the health system; nonetheless, rewards are limited and incentives remain inadequate to match their contribution to the health system (Hajbaghery et al. 2005; Nasrabadi et al. 2003). Around 20,000 nurses remain unemployed, with limited employment opportunities for new nursing graduates, especially in urban areas (Nasrabadi et al. 2004).
As shown in Figure 9-5, the increase in the number of physicians outpaced the increase of dentists and pharmacists.

**Figure 9-5: Trends in Physicians per Capita Relative to Dentists and Pharmacists (1991–2001)**

*Source: Iranian Medical Association (2003).*

*Note: The numbers of physicians, dentists, and pharmacists cover MOHME and the private and nongovernmental sectors.*

### Human Resources Employment

The MOHME is the largest single employer of health workers. Within its hospitals, the MOHME essentially has two human resources systems in operation: the civil service system and the contract-based system. The civil service system is managed centrally and staff recruitment and placement are also conducted centrally. The health workers under this category are civil servants, hired as full time employees or ‘permanent’ employees according to civil service regulations, and have certain entitlements.
such as job security. The hospitals do not have the power to “hire and fire” such staff; decisions are made, if at all, by the center.

The second system involves the use of short and long-term contractors, and specialists paid for performing specific services and procedures. The contract-based system involves using local income funds (derived from insurance payments for health services and co-payments) to recruit staff to meet specific hospital needs on a contractual basis. The recruitment and service terms are managed locally by the hospital. These usually comprise a smaller fraction of workers, although with the current increases in privatization and autonomization (Sections 5 and 6), the fraction of workers in this category may increase with time.

Hospitals are already making significant use of contracted staff and other types of workers. As Figure 9-6 indicates, an estimated 59 percent of health care workers in IR Iran are civil servants, with the remainder hired as long-term contractors (6.5 percent), short-term contractors (6.4 percent), project-based and general practitioners (10 percent), and others 18.6 percent.

**Figure 9-6: Types of Human Resources Contracts**

![Figure 9-6: Types of Human Resources Contracts](image)


The extent to which different contractual arrangements are used varies by province. The province with the lowest proportion of civil servants is Isfahan (39 percent); the highest proportions are found in the Azerbaijan provinces (68 percent). Figure 9-7 shows the proportion of hospital workers hired as civil servants, by province.
Figure 9-7: Proportion of Hospital Workers Hired as Civil Servants by Province (2006)


International Workforce Comparisons

Figure 9-8 compares physician density across countries in the Middle East and Europe. In general, Iran appears to rank relatively low in physicians per capita, though the numbers available are only those for the public sector, making it difficult to create a meaningful comparison.

Figure 9-8: Physicians per 1,000 Populations for Selected Countries (1997–2004)


Note: The number of physicians in IR Iran represents only physicians working in the public sector.

However, Figure 9-9 compares physician density across countries, based on their average per capita GDP. As a general pattern, as GDP increases, the average number of physicians per population increases. IR Iran appears to place right on the regression line, therefore following this average trend.
Figure 9-9: Physicians per 1,000 Populations by GDP Per Capita (1995–2003)

![Graph showing the relationship between per capita GDP and physicians per 1,000 populations, with a notable point for Iran highlighting its lower number of physicians relative to GDP per capita.]


Note: The number of physicians in IR Iran include physicians in both public and private sectors.

Figure 9-10 illustrates a cross-country comparison of nurse density in selected Middle East and European countries. Similar to Figure 9-9, IR Iran has a relatively low number of nurses per capita relative to other countries in both the EU and the surrounding region. No comparable numbers are available for nurses adjusted by GDP per capita.

Figure 9-10: Nurses per 1,000 Populations for IR Iran, Countries in the Region, and EU (1997–2004)

![Bar chart showing nurse density per 1,000 populations for various countries, with a bar for Iran and other countries in the region and EU.]  


Note: Data are from latest available year.

Health Resource Development

The human resource training capacity in the Islamic Republic of Iran is substantial. According to a 2004 MOHME report, Iran had 37 medical schools (WHO 2006), 16 schools of dentistry, 16 schools of pharmacy, 53 schools for nursing and midwifery, 20 schools for paramedical training, 4 schools for medical management, 9 independent medical education centers, 68 medical education centers of Azad
University, and 37 institutes of public health. By 2006, there were 41 medical universities in the country; 38 of the medical universities are government-controlled universities whereas 10 medical universities are private. The number of doctors and health workers being trained has been on the rise as shown in Figures 9-2 and 9-5 earlier in the section. The number of doctors graduating annually increased from 2,392 to a high of 5,614 in 1995, and then fell to 4,153 in 2001; it has begun to rise again in this decade. On the contrary, the number of trained nurses, which increased from 3,899 in 1991 to a high of 7,061 in 1996, remained relatively close to its 1996 level by 2001 (6,926 trained nurses).

Although IR Iran has witnessed significant advancements in various areas, a system of health human resource (HR) planning has not been established. Needs assessments on required skills and specialties are done on ad-hoc basis, not systematically. This lack of the systematic planning of health HR resulted in the over production and unemployment of different health professionals. Recently, this high unemployment of medical doctors, nurses, and technicians became a national issue and triggered debates. In response, the MOHME has established a special task force team to develop solutions for this oversupply and high unemployment of physicians and other health professionals. The special task force has proposed solutions such as a reduction of the number of new students and encouraging oversight for employment for medical doctors. To date, these proposals have remained only proposals.

**Medical Education Policy and Curriculum**

The MOHME was established in 1985 with two main objectives: (i) establishment of an institution responsible for higher education in medicine and oversight for scientific independence of provincial medical universities; and (ii) integration of medical education with the preventive and curative care in a practical manner and efficient way. During the evolution of the MOHME, many positive results have accrued such as increasing numbers of medical schools and physicians, and establishing a more comprehensive health care system in the country. Additionally, the undersecretary of research in the MOHME encouraged Iranian researchers nationwide to engage in scientific research studies. This resulted in strengthened linkage between the research findings and health service delivery.

In spite of prominent evolution of the medical education in Iran, the country now is at the crossroad: considering current burden of disease and challenges presented to the health system, medical education is perceived as outdated; dated learning strategies and methods are applied. Discussions and evidence are suggestive that since the revolution, medical education has made significant improvement; however, prioritizing quantity over quality was the focus. This in turn has led to a substantial number of unemployed physicians. Not every doctor is willing to move to rural areas, creating a surfeit of doctors in urban areas.

A second issue is that the current curriculum focuses mainly on the specialized curative service; less attention and focus has been on preventive, palliative, and inter-professional fields. This is an especially important issue as demographics and disease profile has now been in flux and will continue to move more toward NCDs over time.

Iranian medical schools are still offering courses based on the traditional system from the pre-revolutionary period. The traditional system follows a discipline-based approach, teacher-centered and hospital-based. The curriculum does not adequately allow medical school students to learn about newly emerging diseases and health threats such as non-communicable diseases. A recent article by Tavekol et al. (2006) presents evidence and recommendations that the current medical curricula fall short of EU standards and require an overhaul to models that are more student-centered, problem-based, and system-centered.
The MOHME, which is the main decision making body, might not have not adequately encouraged the universities to improve an outdated curriculum, teaching facilities, leadership, and organization. An improved network between universities and the MOHME as well as improved coordination and cooperation among affiliated and non-affiliated faculty might promote better dialogue across professionals for knowledge sharing and institutional reforms.

Academic partnerships to overhaul curricula and promote programs aimed to address its changing disease profile might be considered too. Medical universities such as Gaja Madja University in Indonesia are an example of one such partner.

**Conclusions and Recommendations**

The number of physicians per population in Iran has increased at a much higher rate than other health workers in Iran, although these numbers overall appear to be in-line with other countries relative to levels of GDP and national income.

Nevertheless, the high number of unemployed physicians is an issue, especially for the younger, newly-graduated physicians in the urban areas. This may be due to limited private sector engagement in overall human resource development, and more probably due to mal-distribution of doctors. Most doctors (84 percent) reside in urban areas where there is competition for few available positions, as the absorptive capacity of the MOHME for new physicians is limited. A paltry 13 percent reside in rural areas. Assessing the number of unfilled vacancies, in addition to conventional assessment of average numbers per population will be necessary in order to truly estimate the gaps in availability of manpower.

Increasing specialization and upgrading the skills of health care workers, especially doctors, has become an alarming trend given the changes in demographics and epidemiologic profile. Iran has a growing specialist to GP ratio, being almost a 1:1 ratio. Between 2000 and 2004, there were more specialists than GPs. This may reflect both numbers of training slots in medical schools as well as market signals related to higher formal and informal payments for specialist services to the hospitals, and the payment arrangements whereby specialists retain a percentage of their fees, as opposed to the GPs who are largely paid a fixed salary. This is countered by new initiatives related to payment policies under the new rural health insurance program with higher salaries and a new bonus system. However, the new incentives under the rural health insurance program may not be enough at least in the short term.

The changing disease profile, especially of the growing urban population, and an increasing prevalence of non-communicable diseases, again spotlights the needed role of primary care physicians and FPs. Structural and financial reforms will be necessary to encourage more doctors to move to rural areas on a more permanent basis. Real income levels, including both formal and informal streams of revenues, as well as the opportunity cost of moving to a rural location, for rural GPs must be competitive with urban specialists if longer-term redistribution of physicians is to occur. Financial incentives should be complemented by curriculum reforms, preferential consideration for medical school admissions, and post-graduate training programs.

In both urban and rural areas, there is a need to pilot and scale-up the integration of family physicians into the health care system and to manage patients through the continuum of care necessary for non-communicable diseases. This will help shift the focus from treatment of specific episodes of illness to harmonization of preventive health measures with curative care, especially as the prevalence of chronic non-communicable diseases increases. It will be important to at least pilot these initiatives and options to learn and to then arrive at the optimal method for addressing human resource needs in the country.
Iran further needs a comprehensive human resource strategy and planning to ensure that the number and skill mix of available health workers matches the current and projected demand. At the moment, no clear evidence of demonstrated linkages between projects human resource needs and intake into medical or nursing schools exists. Provincial medical universities that perform both roles of medical education as well as being the major health service provider are in a position to ensure this match occurs. There may not be much room for reform in Human Resources for Health outside a broader civil service reform, given the fact that most health workers are civil servants. However, consideration should be given to filling HR gaps using other means such as contracting with staff and utilizing the private sector.

**Short-Term Recommendations (One to Two Years)**

1) **Study the Urban and Rural Misdistribution Issue and Develop a New National Strategy.** This should be based on the Iranian experience, but also utilize evidence from international best practice. Recommendations should be multifaceted and multisectoral. This section has discussed some of the key areas such as financial rewards, training opportunities, and changes in curriculum. Recommendations can begin to be implemented as soon as the analysis is completed.

2) **Introduce Changes in the General Practice and Specialty Mix in Medical School Admissions to Train More General Practitioners and Family Medicine Doctors.** Section 5 calls for the introduction of family medicine (FM) as a recognized medical track of study and practice, but this may not be enough by itself. The medical schools have to assure an improved generalist and specialty mix to assure adequate numbers of GPs and FM specialists are available.

3) **Identify Needs for Curriculum Development Changes.** Iran needs a modern workforce and trained according to best international practice. Changes could include more attention to preventive, palliative, and inter-professional fields, as well as more attention to issues like the youth bulge, newly emerging diseases, and health threats such as non-communicable diseases.

4) **Establish a Department within MOHME to Oversee a Long-Term Human Resources Strategy.** This department would undertake medium and longer-term human resource studies to identify needed numbers of physicians, nurses, and other specialists based on demographics and epidemiologic profile, and provide analysis and recommendations for the MOHME and others in the government for legislation, regulation, and budgetary support.
Annexes
Annex A
Human Development Indicators

Despite the remarkable achievements with the Millennium Development Goals, the Islamic Republic of Iran (IR Iran) scores relatively poorly on the Human Development Index (HDI). The HDI provides a composite measure of three dimensions of human development: (i) living a long and healthy life, as measured by life expectancy, (ii) being educated, as measured by adult literacy and enrollment at the primary, secondary, and tertiary levels, and (iii) having a decent standard of living, as measured by purchasing power parity income. By looking at some of the most fundamental aspects of people’s lives and opportunities, it provides a much more complete picture of the development of a country than does other indicators, such as gross domestic product per capita. IR Iran scored 0.746 on the HDI for 2004, which gives ranks it 96th out of 177 countries with data.

Table A-1: Human Development Index (2004)

<table>
<thead>
<tr>
<th>HDI value</th>
<th>Life expectancy at birth</th>
<th>Adult literacy rate</th>
<th>Combined primary, secondary and tertiary gross enrolment ratio</th>
<th>GDP per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(years)</td>
<td>(% ages 15 and older)</td>
<td>(%)</td>
<td>(PPP US$)</td>
</tr>
<tr>
<td>1. Norway (0.965)</td>
<td>1. Japan (82.2)</td>
<td>1. Georgia (100.0)</td>
<td>1. Australia (113.2)</td>
<td>1. Luxembourg (69.961)</td>
</tr>
<tr>
<td>94. Dominican Republic (0.751)</td>
<td>83. Viet Nam (70.8)</td>
<td>83. Swaziland (79.6)</td>
<td>90. Gabon (72.4)</td>
<td>70. Turkey (7,753)</td>
</tr>
<tr>
<td>95. Belize (0.751)</td>
<td>84. Brazil (70.8)</td>
<td>84. Saudi Arabia (79.4)</td>
<td>91. Costa Rica (72.4)</td>
<td>71. Libya (7,570)</td>
</tr>
<tr>
<td>96. Iran (0.746)</td>
<td>85. Iran (70.7)</td>
<td>85. Iran (77.0)</td>
<td>92. Iran (72.2)</td>
<td>72. Iran(7,525)</td>
</tr>
<tr>
<td>97. Georgia (0.743)</td>
<td>86. Jamaica (70.7)</td>
<td>86. Nicaragua (76.7)</td>
<td>93. Timor-Leste (71.7)</td>
<td>73. Dominican Republic (7,449)</td>
</tr>
<tr>
<td>98. Maldives (0.739)</td>
<td>87. Philippines (70.7)</td>
<td>87. Solomon Islands (76)</td>
<td>94. Honduras (71.4)</td>
<td>74. Kazakhstan (7,440)</td>
</tr>
<tr>
<td>177. Niger (0.311)</td>
<td>177. Swaziland (31.3)</td>
<td>128. Mali (19.0)</td>
<td>172. Niger (21.5)</td>
<td>172. Sierra Leone (561)</td>
</tr>
</tbody>
</table>


Since the mid-1970s, almost all regions of the world have been progressively increasing their HDI score. South Asia and East Asia have experienced accelerated progress since 1990. Their growth rate has been larger than OECD countries and Latin American and Caribbean countries. IR Iran’s HDI progress has not been as rapid as the South and East Asian countries; however, their progress in particular after 1980 has been faster than the progress observed in the Latin American and Caribbean countries. This positive trend may be the result of two Iranian policies: throughout the country and among its entire population, (i) to promote primary health care and (ii) provide basic education. In the last ten years (since around 1998 onward), IR Iran’s HDI progress has been slow.

The HDI measures average achievements in a country, but it does not incorporate the degree of gender imbalance in these achievements. The gender-related development index (GDI) incorporates the degree of gender imbalance and captures inequalities in achievement between women and men. IR Iran’s GDI value for 2004 was 0.736, 98.7 percent of its HDI value.
The Islamic Republic of Iran is ranked tenth on the Human Development Index among the 16 countries in the Middle East and North Africa region. The country’s GDI is fairly close to the HDI, which indicates that the gender equality is relatively well achieved.

Annex B
Millennium Development Goals

Of the Millennium Development Goals indicators related to health, the Islamic Republic of Iran is on track to achieve the targets for the year 2015. According to the World Bank’s estimate, infant mortality has nearly halved from 54 per 1,000 live births in 1990 to 31 per 1,000 live births in 2005. The same trend holds true for under-five mortality, reducing from 72 per 1,000 live births in 1990 to 36 per 1,000 live births in 2005.

Figures B-1 and B-2: Reduction of Child Mortality

As indicated by Figure B-3, the proportion of one-year-old children immunized against measles increased from 85 percent in 1990 to 94 percent in 2005. This trend shows a high probability that all one-year-old children will be immunized against measles in 2015. The main reasons for improvement of the status of children’s health include strong government commitment to improve public health and reducing child mortality stipulated in the First and Second Five-Year Plans. Government initiatives have led to increased immunization coverage, promotion of exclusive breast-feeding, and a safe motherhood campaign.

Note: WDI 2007 is a World Bank projection.
In relation to poverty, in general, it is likely that IR Iran will achieve the poverty-related targets by 2015. Although some of the baseline values are not available, the observed trend of the poverty rate and the poverty gap between 1995 and 2002 indicates that IR Iran is on track to halve (i) the proportion of the population below USD 1 a day and USD 2 a day and (ii) the poverty gap ratio by USD 1 and USD 2.\(^5\) Regarding the indicators on hunger, the proportion of underweight children under five years old has been reduced from 15.8 percent in 1991 to 5.0 percent in 2004.\(^5\) In fact, the prevalence of underweight children has already been reduced by one-third in the last thirteen years. Despite the overall improvement of children’s nutrition, the provincial gap of prevalence of child malnutrition persists and micronutrient deficiency is an unresolved issue (see Section 4).

Maternal health, measured by maternal mortality and assisted birth delivery, has improved from 1990 to 2005. Unlike child mortality, maternal mortality ratio estimates are available for only three data years (1990, 1995, and 2000) derived by Reproductive Age Mortality Survey (RAMOS) or estimation based on the latest census results. With the available mortality ratios, it is likely that IR Iran will be able to reduce its maternal mortality rate by three-fourths by 2015. Major reasons for declined maternal mortality and high percent of assisted delivery include:

- A decreased fertility rate;
- An increase in late marriage and child bearing;
- Improved rural literacy among rural women;
- Better access to emergency obstetric services; and,
- Expansion of primary health care services throughout the country.

In IR Iran, a very high percentage of women have received delivery assistance by skilled health professionals. In 2005, the MOHME reported that 97 percent of the delivery was assisted by medically trained professional.

\(^5\) Based on the estimates provided by Institute for Management and Planning Studies (2006).
\(^5\) The 1991 value is the estimate by the Management and Planning Organization in Iran. The 2004 value is from Anthropometric Nutritional Indicators Survey 2004.
Regarding the HIV/AIDS-related indicators, the current information system does not allow us to collect HIV prevalence among 15–24 year old pregnant women or the number of children orphaned by HIV/AIDS. The prevalence of contraceptive use among women in reproductive age is quite high, as discussed earlier. However, the prevalence of condom use among married women is relatively low, only around 7 percent. Currently, the majority of those who are infected HIV are concentrated among high risk groups (e.g., intravenous drug users). However, it is likely that the HIV infection will spread to the general population if there is no further public intervention. The low prevalence of condom use among married women remains a concern.

The Islamic Republic of Iran has been successful in controlling tuberculosis and malaria through their strong primary health care services. On national average, the MDG indicators related to malaria and tuberculosis are basically on track. The proportion of tuberculosis cases detected and cured under directly observed treatment, short course (DOTS), has been nearly 100 percent in the last several years; however, when it comes to the case detection rate, IR Iran scores around 50 percent, which is significantly lower than the WHO standard of 70 percent. This is mainly due to the fact that cases diagnosed in the private health sector or health insurance service networks are not reported to the MOHME. Although malaria is relatively well controlled, it still is a health problem in the southeastern part of the county.

Overall, IR Iran has already made significant progress in achieving its health-related MDG indicators. On the other hand, the promising trend at the national level may mask the regional and income disparity in the health-related MDG indicators. The MOHME’s recent study on health outcomes in rural areas found that a relatively large disparity in child mortality by provinces exists, and that infant mortality tends to be adversely correlated with the income level of the household (MOHME 2003). Further investigation is required to gain an in-depth understanding of determinants of these disparities. Currently, a limited number of studies analyzed solely the relation between child mortality and region or income level. It would be useful to examine regional or income disparity in other health outcomes, such as child malnutrition, immunization coverage, and practice of assisted delivery.

Related, though the neonatal mortality rate in rural areas has dropped from 71 per 1,000 live births in 1970 to 19 in 1998, the rate has been stagnant and has not improved. The increase in the death ratio of the neonates to the number of child deaths aged 1–59 months has increased from 57 percent (19:33) in
1998 to 141 percent (17:12) in 2002 (Figure A-6). This issue also requires further investigation on the potential explanation for the stagnant neonatal mortality rate.

Figure B-6: Trends of Neonatal and Child Mortality Rates
In Rural Iran (1988–2002)

### Annex C
**Glossary of Terms**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AFMSO</strong></td>
<td>Armed Forces Medical Services Organization.</td>
</tr>
<tr>
<td><strong>Ambulatory care</strong></td>
<td>All types of health services provided to patients who are not confined to an institutional bed as inpatients during the time services are rendered.</td>
</tr>
<tr>
<td><strong>Accreditation</strong></td>
<td>The process by which an authorized agency or organization evaluates and recognizes an institution or an individual according to a set of “standards” describing the structures and processes that contribute to desirable patient outcomes.</td>
</tr>
<tr>
<td><strong>Burden of Disease</strong></td>
<td>Disease profile of any population, often measured in terms of mortality, morbidity, or some combination.</td>
</tr>
<tr>
<td><strong>Case Mix</strong></td>
<td>Case mix simply refers to a way of aggregating patterns of patient types for comparison and analysis. Case mix systems allow each patient to be categorized into relatively homogenous groupings of a larger number of patients. Homogeneity is defined through factors such as principal diagnosis, discharge diagnosis, major procedures, and resource use.</td>
</tr>
<tr>
<td><strong>CIS</strong></td>
<td>Clinic Information System, the computer system used for running the operation of a small single physician clinic or a polyclinic.</td>
</tr>
<tr>
<td><strong>DALY</strong></td>
<td>A health gap measure that extends the concept of potential years of life lost due to premature death (PYLL) to include equivalent years of ‘healthy’ life lost by virtue of being in states of poor health or disability. The DALY combines in one measure the time lived with disability (the years of life lost due to premature mortality, YLL) and the time lost due to premature mortality (the years of life lost due to disability for incident cases of the health condition).</td>
</tr>
<tr>
<td><strong>Decentralization</strong></td>
<td>Changing relations within and between a variety of organizational structures/bodies, resulting in the transfer of the authority to plan, make decisions, or manage public functions from the national level to any organization or agency at the subnational level.</td>
</tr>
<tr>
<td><strong>DSM (Diagnostic and Statistical Manual of Mental Disorder)</strong></td>
<td>The Diagnostic and Statistical Manual of Mental Disorder, or DSM, is a handbook for mental health professionals that lists different categories of mental disorder and the criteria for diagnosing them, according to the publishing organization, the American Psychiatric Association. It is used worldwide by clinicians and researchers as well as insurance companies, pharmaceutical companies, and policy makers.</td>
</tr>
<tr>
<td><strong>EDS</strong></td>
<td>Electronic Discharge Summary (from each hospital admission).</td>
</tr>
</tbody>
</table>

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52 Some of these definitions are from the glossary on the Health Observatory website [www.euro.who.int/observatory/Glossary/Toppage](http://www.euro.who.int/observatory/Glossary/Toppage).
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>EES</td>
<td>Electronic Encounter Summary (from each clinic/outpatient visit).</td>
</tr>
<tr>
<td>Efficiency</td>
<td>The extent to which objectives are achieved by minimizing the use of resources.</td>
</tr>
<tr>
<td>Equity</td>
<td>Principle of being fair to all, with reference to a defined and recognized set of values. Equity in health implies that everyone should have a fair opportunity to attain their full health potential and, more pragmatically, that no one should be disadvantaged from achieving this potential. Equity can be differentiated in two ways: vertical equity (preferential treatment for those with greater health needs), and horizontal equity (equal treatment for equivalent needs).</td>
</tr>
<tr>
<td>Health Attendant (health aid)</td>
<td>Native resident of the village, who has at least completed primary school, and has passed the related two year theoretical and practical health training course.</td>
</tr>
<tr>
<td>Health House</td>
<td>First unit offering primary health and medical services under the national health and treatment network. Health homes are located in villages and provide services to one or more nearby villages with a total population of 1,500, depending on geographical characteristics, communication facilities, and population distribution. Workers of health homes are composed of male and female health attendants and health aids.</td>
</tr>
<tr>
<td>Hospital</td>
<td>Unit with at least 15 beds, medical equipment, and facilities, required general medical services, as well as two internal and surgical wards operated by a group of specialists.</td>
</tr>
<tr>
<td>IKF</td>
<td>Imam Khomeini Foundation</td>
</tr>
<tr>
<td>Licensing</td>
<td>The establishment of legal restrictions defining which individuals or (institutions) have the rights to provide services or goods (usually based on meeting minimum requirements).</td>
</tr>
<tr>
<td>Management Information Systems</td>
<td>Systems for planning, organizing, analyzing, and controlling data and information, including both computer-based and manual systems.</td>
</tr>
<tr>
<td>Maternity Hospital</td>
<td>Unit with at least 15 beds, one obstetrician as well as one operating room.</td>
</tr>
</tbody>
</table>
| Medical Establishments | All medical centers including hospitals, maternity hospitals, and sanatoriums equipped with medical beds. May be classified in three categories:  
- Medical establishments affiliated to MOHME;  
- Private medical establishments;  
- Other medical establishments such as those affiliated to the Social Security Organization, charity institutions, Martyr Foundation, and Bank Melli. |
<p>| MOHME              | Ministry of Health and Medical Education, Government of the Islamic Republic of Iran.                                                     |
| MSIO               | Medical Social Insurance Organization, the national payer which has responsibility for health insurance for individuals.                     |</p>
<table>
<thead>
<tr>
<th><strong>Islamic Republic of Iran, Health Sector Review, Volume II</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>employed in the public sector, and their families, and for various safety net funds to serve less fortunate individuals and their families.</strong></td>
</tr>
<tr>
<td><strong>NCD</strong></td>
</tr>
<tr>
<td><strong>NHDD (HDD)</strong></td>
</tr>
<tr>
<td><strong>OTS</strong></td>
</tr>
<tr>
<td><strong>Out-of-Pocket (OOP) Payments</strong></td>
</tr>
<tr>
<td><strong>Paramedics</strong></td>
</tr>
<tr>
<td><strong>Payment Methods</strong></td>
</tr>
<tr>
<td><strong>Physician</strong></td>
</tr>
<tr>
<td><strong>Pooling</strong></td>
</tr>
</tbody>
</table>
services at lower prices, and can reduce administrative overhead of insurance organizations.

<table>
<thead>
<tr>
<th>Purchasing</th>
<th>Payment, contracting, and organization of specified types of health care for a designated population, whether defined by geography, employment type, or voluntary enrollment, over a given time period.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiography Centers</td>
<td>Diagnosis and treatment of diseases through application of rays by specialists in radiography, radiography technicians, as well as experimental radiographers holding a work license from the Ministry of Health and Medical Education. In this report, radiography center refers to a place for radiology tests and providing radiography services, the qualification of which is confirmed by the Ministry of Health and Medical Education.</td>
</tr>
<tr>
<td>Resource Allocation</td>
<td>Process by which financial resources flow from a third party payer (e.g. government, insurer, etc.) to a devolved health care purchaser/plan.</td>
</tr>
<tr>
<td>Revenue Collection</td>
<td>A process by which the health system collects money from households, organizations, firms, and donors. For this purpose, the health sector employees various methods, including public taxes, mandatory social insurance contributions (sometimes in proportion to income level), out-of-pocket payments, and donations. In most developed countries, the emphasis is put toward public taxes or compulsory social insurance payments, while in developing and low-income countries revenue collection is mostly based on out-of-pocket payments.</td>
</tr>
<tr>
<td>Sanatorium</td>
<td>Unit with at least 15 beds, general necessary facilities, and services as well as one specialized ward, operated by a group of specialists in related fields including mental homes, leper houses, homes for tuberculosis patients, and drug addicts.</td>
</tr>
<tr>
<td>SSO</td>
<td>Social Security Organization, the national payer that has responsibility for social health insurance for individuals employed in the private sector, and their families.</td>
</tr>
<tr>
<td>YLL</td>
<td>Years of life lost due to premature mortality. YLL basically correspond to the number of deaths multiplied by the standard life expectancy at the age at which death occurs.</td>
</tr>
<tr>
<td>YLD</td>
<td>Years of life lost due to disability for incident causes of the health conditions. To estimate YLD for a particular cause in a particular time period, the number of incident cases in that period is multiplied by the average duration of the disease and a weight factor that reflects the severity of the disease on a scale from 0 (perfect health) to 1 (dead).</td>
</tr>
</tbody>
</table>
Annex D
Acknowledgements and Thanks:
A List of Specialists and Counterparts

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