



**BRIEF FOR THE RUSSIAN AUTHORITIES
ON HARMONIZED INFECTIOUS
DISEASES SURVEILLANCE
INFORMATION SYSTEMS IN THE
WORLD: ANOTHER CHALLENGE FOR
THE G-8 GROUP**

The World Bank Group

November 26, 2005

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**Patricio V. Marquez, Lead Health Specialist, ECA, The World Bank, and Alberto
Gonima, World Bank Consultant**

Introduction

With the end of the Cold War, there has been a growing realization that the international community faces a number of transnational challenges that do not emanate directly from the policies of individual states. In turn, these challenges cannot be countered solely by the actions of individual states, as they present a threat to the entire world. One important emerging transnational threat is the spread of infectious diseases across national borders that have the potential to undermine countries' stability, security, economic development and human capital accumulation, and more importantly, the welfare of the population.

The continuing outbreaks of highly pathogenic avian influenza (HPAI) in several Southeast Asian countries that begun in late 2003, and have occurred more recently in Europe, have been disastrous to the poultry industry in the two regions and have raised serious global public health concerns. Recent increases in the number of known cases of avian influenza (AI) transmission have raised concerns over the potential emergence of a pandemic, which could have devastating effects on human health, animal health, and human livelihoods. At the same time, it is important to emphasize that there are many uncertainties about whether and when a pandemic might occur as well as about its potential impact. Nearly 140 million domestic poultry have either died or been destroyed and over 120 people have contracted the infection, of which 63 have died as of November 2005. The geographical spread of HPAI, the human dimension and the huge social and economic impact are unprecedented. Economic losses to the Asian poultry sector alone are estimated at around \$10 billion. Despite control measures the disease continues to spread, causing further economic losses and threatening the livelihood of hundreds of millions of poor livestock farmers, jeopardizing smallholder entrepreneurship and commercial poultry production, and seriously impeding regional and international trade and market opportunities. The rural poor, who rely for a larger share of their income on poultry, have been particularly hard hit with income losses.

It is impossible to anticipate when the next influenza pandemic might occur or how severe its consequences might be. On average, three pandemics per century have been documented since the 16th century, occurring at intervals of 10-50 years. In the 20th century, pandemics occurred in 1918, 1957 and 1968. The pandemic of 1918 is estimated to have killed more than 40 million people in less than one year, with peak mortality rates occurring in people aged 20-45 years. The pandemics of 1957 and 1968 were milder, 1-4 million estimated deaths, primarily in traditional risk groups such as the elderly, but many countries nevertheless experienced major strains on health care resources. If an influenza pandemic virus were to appear again similar to the one that struck in 1918, even taking into account the advances in medicine since then, unparalleled tolls of illness and death could be expected. Air travel might hasten the

spread of a new virus, and decrease the time available for preparing interventions. Health care systems could be rapidly overburdened, economies strained, and social order disrupted. Although it is not considered feasible to halt the spread of a pandemic virus, it should be possible to minimize its consequences through advance preparation to meet the challenge.

Why Infectious and Non-Communicable Disease Surveillance ?

In recent years, the outbreak of mad cow disease in Europe and the multicountry spread of SARS are sobering reminders that globalization increases the risks of importation and exportation of infectious diseases across borders and among continents. Infectious disease surveillance—including surveillance of known communicable diseases (especially those with high epidemic potential), early recognition of new infections, and monitoring of the growing resistance to antimicrobial medications is critical for the early detection and prevention of epidemics. Information from infectious disease surveillance is also important to determine national burdens of disease, health planning, health resource allocation, and advocacy.

Surveillance of infectious diseases has a long history and tradition in the countries of the G-8 groups. However, in many countries, infectious disease surveillance systems have suffered from lack of resources or breakdowns in the sanitary-hygienic report mechanisms from the previous era. These limitations can affect global health.

Moreover, as population profiles shift toward older age groups, countries experience an epidemiological transition in which mortality from infectious diseases declines while noninfectious, chronic diseases (heart disease, stroke, chronic lung disease, cancer and injuries) become the main causes of ill health and death. For example, the countries in Eastern Europe and Central Asia are rapidly undergoing or have completed a transformation in the profile of the leading causes of morbidity and mortality in their populations. The costs of health care for these conditions are high, and the growing burden of disease and treatment costs from non-communicable diseases (NCDs) in developing countries threatens to overwhelm the limited financial resources in the health sector.

The major NCDs frequently share common risk factors that are amenable to intervention and modification, such as tobacco consumption; high-fat, low-quality diets; physical inactivity; and alcohol abuse. These risk factors are associated with intermediate outcomes of overweight/obesity, high blood pressure, and diabetes. Surveillance of risk factors is critical to the planning, implementation, evaluation, and advocacy of strategies and programs to prevent and control NCDs as the leading causes of morbidity and mortality in the world.

In sum, health and disease surveillance is a critical part of a country's essential public health functions, which aim to reduce morbidity, disability, and mortality and to maintain and improve the health of the population. By investing in public health surveillance, the health system of a country is made more effective and efficient.

The Challenge Ahead

Given the above situation, there is an urgent need to develop strategies and initiatives to support the harmonization and development of standardized infectious disease surveillance information systems as part of global disease information sharing network to monitor and control the diseases, in line with the G8 members and international surveillance standards like the EU communicable disease surveillance system **Acquis**, thereby contributing towards improved global and regional prevention and control of infectious diseases and NCDs.

The surveillance information harmonization efforts should be geared to strengthen the institutional structure, capacity and the legal framework of the current infectious disease surveillance systems in conformity with G-8 directives in terms of structure, function, capacity, effectiveness and resources. The infectious disease surveillance information systems should be an integral part of national health information systems development initiatives and would be linked with rapid and standardized methods of routine analysis of surveillance data.

Among the strategies to be agreed and implemented are:

- Reengineering and automation of countries' infectious disease and NCDs surveillance information systems and protocols to increase the speed and efficiency of collection and analyses of epidemiological and statistical data. This should be done by addressing critical capacity weaknesses and key constraints at national and regional levels of the Health Information and Statistics Systems, to support investigation and diagnosis of the incidence, focalization of the response and systematic and continuous public health interventions.
- Selection and adoption of "best of breed" health information systems available in G-8 countries at the point of service in outpatient, emergency and hospital-based surveillance and sentinel physician networks to support epidemiologists and clinicians in the screening, diagnosis, detection and control of outbreaks, and respective automation of mandatory disease notification and statistical reporting processes, in linkage with the state service statistics and civil registries for cross reference on citizens ID, birth and death registries databases.
- Development of standards and adoption of information system modules that can be used to track vaccination coverage, track adverse vaccination events, and generate reminders for a second dose where more than one vaccination is needed for protection. Integrating such modules with regional or local immunization registries will increase acceptability and usefulness.
- Establishment of virtual networks and satellite communications connecting Regional Laboratories with National and International Reference Laboratories allowing for the secure exchange of surveillance information, electronic referral of test requests, and individual patient reports. The communication

and connectivity infrastructure would also facilitate the links between clinical units involved in the management of infectious disease patients with the diagnostic support laboratories for confirmation, vaccine safety testing, clinical and epidemiological investigation and drug resistance surveillance.

- Support the development of structures, topologies and standards for national and international infectious diseases data repositories with online analytical processing (OLAP) capacity, allowing for cross reference analysis from multiple databases to report monitoring indicators and surveillance data with real time online information for situation analysis with decision support systems, epidemiological mapping imaging with the use of geographic information systems (GIS) and forecasting models to measure national program outcomes and impact, including data modeling on impact of measures such as “social distancing measures” (e.g., closure of schools and borders), and to guide resource allocation and focalized interventions for the prevention and control of infectious diseases.
- Support the establishment of national, inter-country, border control and regional infectious disease outbreaks web sites for emergency notification to track the disease; to provide preventive measures and preparedness plan with immediate and controlling actions to be taken as an outbreak occurs; diagnostic and emergency response sites and first-line defense against pandemics and outbreaks; communications preparedness activities on how to deal with extraordinary excess demand and possibly panic; and web-based tools and broad search engines and bibliographic databases to supply updated essential information, selected, filtered and commented by a team of professionals specialized in infectious diseases, therapeutics and epidemiology.
- Working with statistical departments and vital statistics units for health statistics mapping using common terminology and health information standards to make data readily available for comparison to national and international benchmarks and accelerate the adoption of electronic medical records.

Conclusion

The design and implementation of the above initiative on a global scale would require strong leadership from the G-8 countries. But it would also be aided by concentrating on efforts that have multiple uses in peacetime as well as during a pandemic. These dual-use investments will be easier to justify if they are presented as an essential step in preparing for a deadly influenza pandemic.

A leading example of such an investment is an electronic health record system, which would allow governments to track the course and impact of a pandemic in real time. Public health experts widely agree that his kind of network would not only allow for safer and more efficient care under normal circumstances, but would also equip governments with the date needed to direct scarce therapies, medical teams and supplies to where they are most needed as a pandemic unfolds.