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Report No. 35626-ZR

Democratic Republic of Congo Health, Nutrition and Population Country Status Report

May 2005

Africa Region Human Development &
The Ministry of Health, Democratic Republic Of Congo

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Abbreviations and Acronyms

ACF	Action Contre la Faim	MAP	Multi-country HIV/AIDS Program
ACT	Artemisin-combination therapy	MDG	Millennium Development Goal
ARI	acute respiratory infection	MDM	Médecins du Monde
ARV	anti-retroviral drug	MICS	Multiple Indicator Cluster Survey
ASRAMES	Association régional pour l'achat des médicaments essentiels au Kivu	MPA	Minimum Package of Activities
BCG	Bacille de Calmette et Guérin	MSF	Médecins sans Frontières
CPA	Complementary Package of Activities	NGO	non-governmental organization
CSR	Country Status Report	OCHA	Office of the Coordinator for Humanitarian Affairs
DHS	Demographic and Health Survey	ORT	oral rehydration therapy
DOTS	directly-observed treatment, short-course	PER	public expenditure review
DPT	Diphtheria-pertussis-tetanus	PMPTR	Programme Minimum de Partenariat pour la Transition et la Relance
DRC	Democratic Republic of Congo	PNLS/IST	Programme National de Lutte contre le VIH/SIDA, les Infections Sexuellement Transmissibles et les Infections Opportunistes
EPI	Expanded Program on Immunization	PNLT	Programme National de Lutte contre la Tuberculose
ESP	École de Santé Publique, Université de Kinshasa	PNSR	Programme National de la Santé de la Reproduction
FEDECAME	Fédération des Centres d'Achat de Médicaments Essentiels	PRSP	Poverty Reduction Strategy Paper
GAVI	Global Alliance for Vaccines and Immunization	PSF	Pharmaciens sans Frontières
GDP	gross domestic product	SNIS	Système National d'Informations Sanitaires
GNI	gross national income	S-P	Sulfadoxine-Pyrimethamine
HIV/AIDS	human immunodeficiency virus/acquired immune deficiency syndrome	TFR	total fertility rate
HNP	Health, Nutrition and Population	UN	United Nations
HPIC	Highly-indebted poor country	UNAIDS	Joint United Nations Program on HIV/AIDS
IMF	International Monetary Fund	UNICEF	United Nations Children's Fund
IPRSP	Interim Poverty Reduction Strategy Paper	US\$	United States Dollar
IRC	International Rescue Committee	WHO	World Health Organization
IRIN	Integrated Regional Information Network		

Vice President:	Gobind T. Nankani
Country Manager/Director:	Pedro Alba
Sector Manager:	Laura Frigenti
Task Team Leader:	Eva Jarawan

Acknowledgements

This Health, Nutrition and Population (HNP) Country Status Report (CSR) for the Democratic Republic of Congo (DRC) was produced in two phases by a World Bank team led by Eva Jarawan (Lead Health Specialist), in collaboration with a Congolese team. The first phase benefited from participatory work of the national "Health and Poverty" team with the assistance of Koffi Ekanmian, World Bank Consultant, and Souleymane Sow (Senior Operations Officer). The national team assembled representatives from a range of partners in the sector, in particular from the Ministry of Health and the National Institute of Statistics, universities and non-governmental organizations (NGOs). The team formed working groups with the following participants: Group I (Analysis of health indicators and household behaviors): Messrs. Kayembe, Kuvula, Matangwa and Manunga; Group II (Analysis of health system performance): Messrs. Wangata, Kalonji, Kabanga, Komba Djeko and Kipulu; Group III (Analysis of Public Health Spending): Messrs. Munyanga, Makengo Maswa, Kangu Muya, Kosi and Kalambay. This first phase produced a preliminary version of the report which was distributed and presented by Mrs. Jarawan during the Round Table on Health held in Kinshasa on May 11-12, 2004. This first version was also subject of discussion during a dissemination and validation workshop.

During the second phase, in-depth analyses were undertaken by the World Bank team, on the basis of studies, action plans, documents from the Ministry of Health, as well as reports from the National Health Information System. The report benefits from data from Multiple Indicator Cluster Surveys (MICS) done by the government, with the support of UNICEF, in 1995 and 2001. The analysis also relied on numerous surveys, some on a national scale, implemented by NGOs and measuring mortality levels, trends, and determinants, as well as other health issues. Finally, the report was enriched by the fieldwork of Dr. Martin Révillion (Consultant/COWI), a large number of small-scale studies and reports by NGOs working in DRC, and the 2002 Public Expenditure Review (PER) done by the Government in collaboration with the World Bank.

This document was written by Mr. Patrick Mullen, World Bank Consultant. Mr. Fabrice Houdart, World Bank Consultant, wrote the chapter on health sector financing, and Mr. Marc Donald Néné (Consultant/COWI) wrote the chapter on organization of the health system. Mr. Krishna Rao (Consultant/COWI) undertook econometric analyses of data on utilization of health services. Special thanks are addressed to Mrs. Nathalie Lopez-Diouf who followed up on the production process of this report.

Finally, the authors would like recognize the generous contribution of the IDA and Danish Consultant Trust Funds for supporting consultants, and publication and dissemination of this report.

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Summary and Conclusion

1. **The objective of this report is to describe and analyze the health, nutrition, and population situation in Democratic Republic of Congo (DRC) in order to inform the Government's strategy development in the sector, particularly in the context of its Poverty Reduction Strategy Paper (PRSP).** The report analyzes health, nutrition, and population outcomes and determinants, focusing on the Millennium Development Goals (MDGs) and the health situation of the poor. Health service utilization and its determinants are assessed, and the main features of the health system described. The policies and strategies of Government and external partners are discussed, with particular attention to the health care financing situation and its impact on the poor.

1. Health situation and the MDGs

2. **Health, nutrition, and population outcomes, including the main sector-related MDG indicators, are extremely poor in DRC and have deteriorated over the past decade.** DRC is emerging from a long and destructive conflict, which followed years of economic crisis, so that it is among the poorest countries in the world. Over one third of under-five children are chronically malnourished (stunting), and 16% suffer from acute malnutrition (wasting), reflecting wide vulnerability to short-term crises. Retrospective mortality surveys have revealed extreme levels of mortality among conflict-affected populations, so that it is estimated that 3.8 million deaths can be attributed to the war since 1997. Under-five mortality, estimated from the 2001 *Multiple Indicator Cluster Survey* (MICS2), is in the range of 220 per 1,000 or greater, one of the highest in the world. Maternal mortality is similarly among the highest anywhere, estimated at 1,289 per 100,000 live births. The total fertility rate remains very high at 7.1.

Table 1. Nutrition and health indicators and estimated numbers of people affected annually, DRC

	indicator estimates	estimated number of people affected annually
population 2004	58,318,000	
gross national income (GNI) per capita 2003 (US\$)*	100	
under-5 malnutrition (stunting) (%)	38	4,210,560
infant mortality (${}_1q_0$) (per 1,000)	128	362,038
under-5 mortality (${}_5q_0$) (per 1,000)	220	565,101
maternal mortality (per 100,000 live births)	1,289	36,458
adult HIV prevalence (%)	4.5	1,167,818

Sources: 2004 MICS2, UNAIDS (2004), World Bank (2004)

3. **Because of its population size and the severity of the health situation, DRC represents an enormous concentration of morbidity and mortality in the center of Africa.** With an estimated 58.3 million inhabitants in 2004, DRC is the third most populous country in Sub-Saharan Africa (after Nigeria and Ethiopia). It is estimated that 4.2 million under-five children are malnourished in DRC, 362,000 infants die before their first birthday, over half a million under-five children die annually, 36,000 mothers die in childbirth annually, and almost 1.2 million adults are infected with HIV.

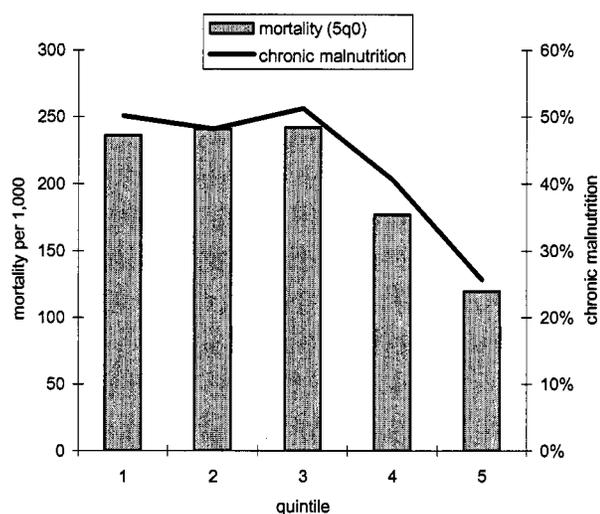
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4. **Malaria is the number one killer of children in DRC.** Malaria is highly endemic in DRC. Surveys have shown that fever is associated with 40% of child deaths and a significant proportion of mortality at all ages. This implies annual deaths of 150-250,000 under-five children due to the disease. Coverage of insecticide-treated bednets is minimal, and parasite resistance to standard treatments is growing.

5. **HIV/AIDS and tuberculosis are major problems.** HIV prevalence is estimated at 4 to 5% among the general population and at least 30% among high-risk groups. Tuberculosis incidence is high, at 384 cases per 100,000 annually according to accepted estimates.

6. **The war has accentuated disparities, although most of the population is affected by the poor health situation.** Household survey data on child mortality and malnutrition show that the western part of the country, not directly affected by the war, generally has better outcomes than the rest of the country. Similarly health indicators are better in urban areas than in rural areas. Nevertheless, even these better-off areas experienced declines since the early 1990s and it should be noted that their health and nutrition situation is poor compared to overall averages in other countries. For example, the estimated under-five mortality rate in 1997 in urban areas was 158 per 1,000, which is comparable to estimates for Tanzania or Ethiopia as a whole, and exceeds the overall rate for Kenya.

Figure 1. Socio-economic inequalities in mortality (ϵq_0) and chronic malnutrition among under-five children, DRC



Authors' estimates from data from 2001 MICS2.

7. **The poor experience higher malnutrition and mortality.** From household survey data, it is estimated that under-five mortality among the poorest quintile of households was 256 per 1,000 in 1997-98, compared to 128 per 1,000 among the highest quintile. (Figure 1) Similarly, in 2001 chronic malnutrition among under-fives was 43% in the poorest households and 19% among the better-off. However, among the lower four quintiles, disparities in these outcomes are not so clear, suggesting a situation of mass vulnerability. At the same time, it should be recognized that although some groups in the population are doing better than others, the health situation of even the better-off groups is far from optimal. Estimated under-five mortality among the most well-off socio-economic quintile in DRC is estimated for 1997 at 128 per 1,000, which, for example, exceeds the estimated rate in Kenya as a whole.

8. **In this situation, achieving progress towards the MDGs will require significant effort and resources.** The worldwide MDG targets are expressed as reductions in malnutrition and

mortality as a proportion of 1990 levels. DRC has not only lost the decade of the 1990s, but has gone backwards towards, for example, mortality and life expectancy levels last experienced in the 1950s and 60s. Although there is evidence that mortality in particular may be improving as peace is consolidated, reversing this situation will depend on, first of all, political and economic stability, but also significant focus and investment

2. Households and communities

9. Important household-level determinants of health and nutrition outcomes are mothers' education, and behaviors such as breastfeeding, sexual practices, and contraceptive use.

Except for fever incidence (which largely depends on the epidemiological pattern of malaria), most of the various multivariate models of the determinants of a number of health outcomes (child mortality, malnutrition, diarrhea, and respiratory infection) show that children of mothers with any education are at lower risk – even after controlling for socio-economic status. This is consistent with findings in many other countries, and can be explained by better-educated mothers having better knowledge of preventive health practices and being more likely to take a sick child to a trained health provider. In DRC, a majority of mothers (72%) have received at least some education, but the proportion is considerably lower in rural areas (62%) than in urban areas (91%). These somewhat encouraging statistics are tempered by the estimate that current gross enrolment rates in primary school are around 65%, consistent with other poor countries in Sub-Saharan Africa.

10. Exclusive breastfeeding is a crucial determinant of infant and child health and nutrition as well as child development. While almost all children are breastfed to an extent, only around a quarter are exclusively breastfed during their first six months of life, and this rate has been decreasing over time. Among other practices with a important impact on health are modern contraceptive use, which is low at 4.4%, and risky sexual behavior.

11. Poverty, affecting the mass of the population, clearly undermines health and nutrition status. For all the health and nutrition outcomes analyzed (except fever incidence), there are clear and large differences between the poorest and the most well-off. The various regression models show socio-economic status as a consistent determinant of health outcomes. For example, controlling for a variety of other factors, children from households in the highest quintile are around 0.7 times less likely to have respiratory infections or diarrhea. However, such associations are not as evident over the lower ranges of household economic status, indicating that the mass of the population is at a similar level of poverty and suffers similarly from poor health and nutrition. However, it is evident that increasing inequality is a large risk as the country's economy grows in the coming years.

12. Very important among community-level – contextual – factors, the conflict since 1997 has caused severe increases in mortality and deterioration in other health and nutrition outcomes. Extreme levels of mortality have been measured among conflict-affected populations, while mortality was also observed to increase in other parts of the country not directly affected by fighting. Data show that most deaths were not directly due to violence but related to the disruption of the economy and society and deterioration of household coping mechanisms. The direct and indirect effects of the conflict on health and nutrition worked through many mechanisms, including its impact on household resources, on the health system, on other sectors, and on Government action and finances – including the health system

13. Empirical evidence for the effects of the conflict on nutrition and health outcomes can be readily seen in time trends and geographic patterns at both national and regional levels. A regression model found that, controlling for a variety of other factors including socio-economic status, children in the Center and East of the country were far more likely to be chronically

malnourished than children in the western Provinces.¹ Surveys among particular war-affected populations revealed sometimes extreme levels of mortality, while a regression model indicates that, other important factors held equal, the risk of child mortality in 2001 was significantly greater in the Center and East than in the West. With regard to trends, household survey data indicate that chronic child malnutrition increased between 1995 and 2001 in the East of the country while remaining stable or declining elsewhere. Retrospective mortality surveys showed increased mortality coinciding with the most intense periods of the conflict, with the largest increases concentrated in the Center and Eastern parts of the country, most directly-affected by the war.

14. There is evidence that the conflict decreased the importance to health of socio-economic factors such as education and household economic status, but increased the importance of access to health services. Regression models of child mortality data from household surveys in 1995 and 2001 indicate that the protective effects of mother's education and household economic status lessened over time, suggesting that the conflict affected wide swathes of the population regardless of their socio-economic status. However, the analyses suggest that the positive effects of access to health services may be accentuated over time, particularly in the regions most affected by the war. This is encouraging evidence that health services make a difference in such situations.

3. Health service utilization

15. At the household level, utilization of basic child health services is low overall. In general, utilization of preventive health interventions for children is low. In 2001, only 50% of one-year-olds were vaccinated against measles and BCG, only 11.5% of under-fives recently received vitamin A supplementation, and only 0.7% of under-fives slept under an insecticide-impregnated bednet. Similarly, utilization of primary curative interventions is low. Various sources of information indicate that the per capita rate of curative consultations in many areas is 0.20 or less, compared to around 0.60 observed in the 1980s. In 2001, only a third of children with respiratory infections and half of children with fever received treatment by a health provider.

16. With the exception of antenatal care, reproductive and maternal health service utilization is low. Utilization of family planning services is very low, with modern contraceptive prevalence at 4.4%. Although utilization of antenatal care from medical personnel is relatively high at 65.7%. Delivery care by a medical provider is much lower, at 32.0% in urban areas, 20.2% in rural areas and 23.7% overall in 2001. Although information is not available on utilization of emergency obstetric care – the main determinant of maternal mortality – it is known that geographic and financial accessibility and quality are significant problems in DRC. For example, a study of data from two rural hospitals concluded that only 3% of potential complicated births arrived at the referral facilities.

17. Nevertheless, many people do not access services, particularly the poorest. In both urban and rural areas, the 2001 MICS2 found that 40-45% of children with respiratory infections do not receive treatment, and about 25% seek medication from drug sellers or others. A number of more recent smaller studies have found that 50-60% of people who are ill do not go to a formal health provider; they prefer to either not seek treatment or to self-medicate. In general, up to two-thirds of cases do not go to the formal health system for care.

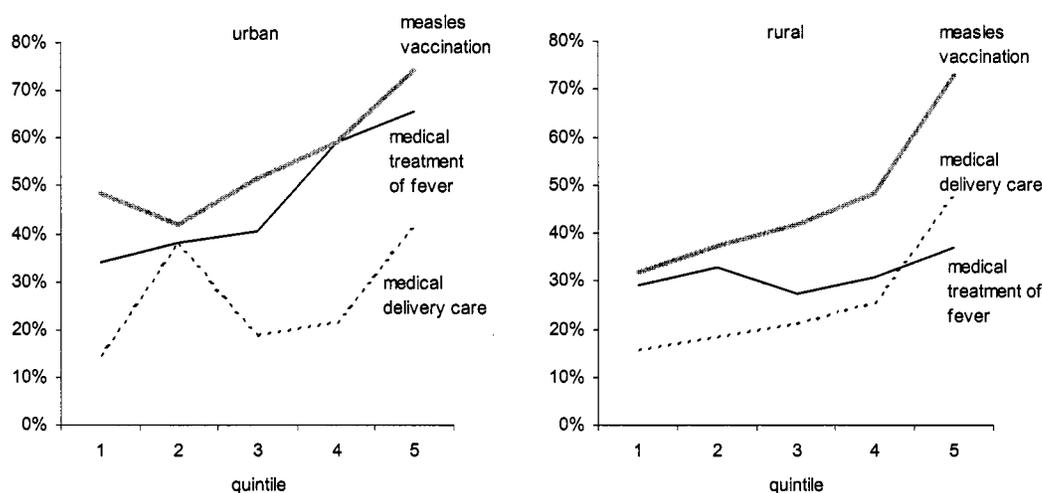
¹ For the purposes of this report Provinces are grouped as follows: West (Bas-Congo, Kinshasa, and Bandundu), Center (Equateur, Kasai-Oriental, Kasai-Occidental, and Katanga), and East (Province-Orientale, Maniema, Nord-Kivu, and Sud-Kivu).

Summary and Conclusion

18. The poorest are significantly less likely to use basic health services. In both urban and rural areas of DRC, utilization of basic health services steadily decreases with lower socio-economic status. (Figure 2) For example, in both urban and rural areas, around 15% of mothers from the poorest quintile received delivery care from medical staff, compared to around 45% in the highest quintile. Similarly, in urban areas, 34% of febrile children from households in the poorest quintile are likely to be treated, compared to 66% among the highest quintile. The proportions in rural areas are 29% and 37% respectively. Regression models show that comparing each quintile to the next higher one, children in the higher quintile are 1.2 to 1.4 times more likely to be vaccinated against measles and to receive medical care in cases of fever or respiratory infection.

19. Financial barriers are one of the main reasons for low utilization of services among the poor. Low coverage and insufficient inputs and quality have reduced overall service utilization, but the poor are more affected due to the financial barriers related to the lack of public funding for the system. Unlike with health outcomes, elasticity of service utilization is evident over the entire socio-economic scale, suggesting that demand is dependent to a considerable extent on financial factors. A number of smaller surveys have found that 10-20% of people requiring care do not receive treatment due to financial reasons. Similarly, trend data in specific Health Zones show that utilization can increase significantly when consultation fees and drug prices are reduced (and quality increased) under external assistance programs.

Figure 2. Utilization indicators by socio-economic status quintile, urban and rural, DRC, 2001



Authors' estimates with data from 2001 MICS2.

20. The cost of health services can have impoverishing effects. In the absence of Government and external funding, the main burden of financing health services has been left to households. Given the level of poverty in the country, this burden cannot be sustained by many households, so they choose to either not seek care, to obtain cheaper treatments from non-formal providers, or to further impoverish themselves. For example, a 2003 study in Nord-Kivu found that in order to pay medical bills, 24% of patients sold assets and 18% went into debt.

21. Mothers' education is an important determinant of health service utilization, particularly in urban areas and particularly preventive care. In urban areas, utilization of health services, particularly preventive interventions, increases with each year of mothers' schooling, but the association is not as clear in rural areas – suggesting that lack of service accessibility in rural areas (both geographic and financial) may affect both the educated and non-educated. Regression models indicate that mothers with any amount of education are more likely

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to have received medical delivery care and to have children who are vaccinated against measles. However, after controlling for socio-economic status in particular, such an advantage is not evident with regard to basic curative care for children – again suggesting that service availability may be the issue.

22. Residents of rural areas are less likely to utilize health services, both because they are poorer and because of less service availability. In 2001, measles immunization coverage of one-year-old children was 65% in urban areas, but only 40% in rural areas. Similarly, delivery care by a medical professional was 32% in urban areas and only 20% in rural areas. Regression models controlling for socio-economic status show that service utilization is considerably more likely in urban areas, probably reflecting greater availability of services. For example, a child with fever is 1.4 times more likely to receive medical treatment in an urban area.

23. Regional differences in service utilization are not as evident as with health outcomes. There are clear regional differences in measles immunization coverage between regions, particularly in rural areas, with children in the western Provinces more likely to be vaccinated. However, disparities in utilization of other types of services are not as evident. Except for measles immunization, the various regression models of determinants of utilization indicators do not show significant effects associated with region.

24. The limited available trend data indicate that between 1995 and 2001, utilization of basic curative services declined overall, while coverage of some preventive interventions remained stable or slightly improved. Trend data on curative care services is limited; however, it is estimated that in 1995, around 55% of children with respiratory infections received medical care, and this declined to an estimate of 48% in 2001. Evidence on trends in coverage of basic preventive services is more positive, as measles immunization coverage increased from 32% to 48%, and antenatal care coverage remained stable at around 63%.

25. It seems that declines in utilization of curative care occurred in all regions, but improvements in child immunization in particular were concentrated in the Center and East of the country. For example, the proportion of children with respiratory infections who received treatment decreased from 58% to 50% in the West, from 52% to 42% in the Center, and from 60% to 52% in the East. However, while measles immunization coverage remained stable in the West at around 55%, it increased significantly in the Center and East, from around 25% to 40-50%. The reasons for these patterns are unknown. Perhaps the humanitarian response to the conflict in the Center and East was successful in raising immunization rates through mass campaigns, but had less effect on curative services.

26. Nevertheless, data on utilization and patient perceptions indicate that the demand for formal sector health services run by Government, churches and NGOs is important, providing a good basis for development of the system. Household survey data indicate that 40% of children with respiratory infections in urban areas and 30% in rural areas receive care from public or confessional health services. The proportion treated in hospitals (15% in urban areas and 2% in rural areas) is relatively low, indicating that contrary to what can be observed in other countries, the referral system is not bypassed (although this may be due to a lack or deficiencies in hospital services). These data indicate that the public primary health care system can attract a significant proportion of the demand for care. At the same time, data on user opinions about service quality, particularly in urban areas, suggest relatively good perceptions (except with regard to the cost of services). A 2004 survey in nine provinces found that 80% of patients who went to a hospital were satisfied or very satisfied with their treatment.

27. The patterns in utilization discussed above reflect not only demand but also supply factors, particularly service coverage, quality, and cost. Higher utilization in urban areas reflects better service coverage and perhaps also better quality. Regional differences in service

utilization are not as evident, although the western Provinces seem to be better-off than the rest of the country. Socio-economic differences in service utilization are clear, and certainly reflect financial barriers to care, but also likely differences in service availability between poorer and better-off populations.

4. Health system

28. The organization of the health system is decentralized, with primary and first-referral services integrated in Health Zones. In the 1980s, the country was a leader in reforms which focused on integrated primary with first-referral services on the Health Zone model. Much of the thrust of development of the system was on improving the functionality of the Health Zones.

Each Health Zone is responsible for primary and referral care among a catchment population of on average 110,000. The number of Zones was increased by the Government in 2001 from 306 to 515. Above the Health Zone in the administrative hierarchy are Districts, Provinces, and the Ministry of Health headquarters in Kinshasa. Except for their responsibilities for provincial and tertiary hospitals, the roles of these levels are not operational but focused on overall policy-setting, supervision, and regulation.

29. Health Zones and individual facilities operate with considerable autonomy, although Ministry structures have retained a certain administrative control, particularly over personnel. Lack of Government funding over the past decade has led to significant autonomy for Health Zones and individual facilities. In the absence of external support, many facilities became *de facto* privatized, relying exclusively on receipts from patients in order to pay staff and operating costs. Hospitals in the major cities operate with almost complete autonomy. In many cases, the oversight function of Ministry of Health structures became only exercises in extraction of revenue from health facilities. Recently, with improvements in the Government's administration and funding, intermediate and central levels exercise more influence, particularly over personnel issues.

30. The Health Zone structure provides a good basis for recovery and development of the system. Economic and social crisis and subsequent conflict in the 1990s severely undermined service delivery, but in many cases Health Zone structures showed remarkable resilience. In many areas, these structures – physical infrastructure and staff – remain in place even though at very low levels of functionality. Recognizing this, external humanitarian and development assistance has been anchored in the existing service-delivery system.

31. The Government has long experience with public-private partnerships, particularly with church groups and NGOs, while the for-profit sector is limited. It is estimated that a third of the health facilities in the country are operated by church groups who have traditionally worked in partnership with Ministry of Health structures. For example, the reference hospital of many Health Zones is a church-run facility. This experience has facilitated more recently-established partnerships with international non-governmental organizations (NGOs) which are implementing assistance programs, particularly at the Health Zone level. Along with the decentralized Health Zone model, this experience with integrating non-governmental actors provides a good foundation for reconstruction of the service delivery system.

32. In the past, parastatal companies, such as transport and mining concerns, operated significant health services, but little remains of this system. Formal for-profit private providers are limited to small clinics and maternities in the major cities. Informal providers, in particular drug sellers, are common in many urban and rural areas.

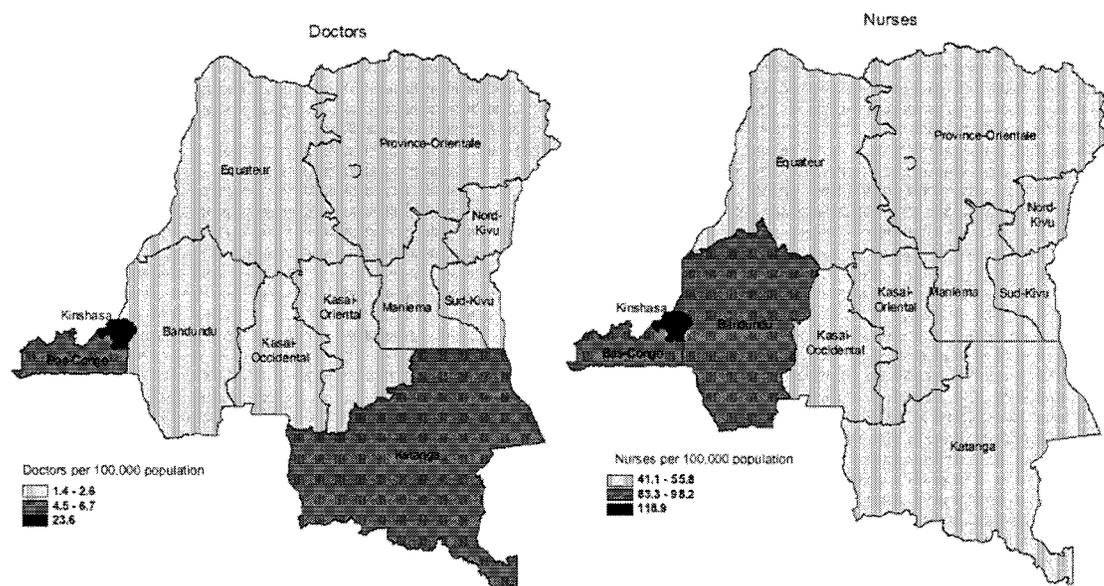
33. Although administrative data is out-of-date, it is clear that geographic coverage is insufficient and deteriorated over the past decade. The Government's recent creation of over

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200 additional Health Zones was primarily a strategy to increase geographic coverage of referral services, since each Health Zone is to have a referral hospital. This is understandable – given the geographic and population size of many of the Zones, a large proportion of the population in rural areas do not live within reach of a health facility. In Equateur, for example, physical accessibility of services varies widely; recent surveys found that in Basankusu 42.7% of households need to walk over eight hours to reach a health facility, while in Befale and Bolomba the proportions are 21.2% and 3.6% respectively.

34. The available inventory of facilities dates from 1998, so does not reflect deterioration of the system since then, particularly in the war-affected parts of the country, where a significant proportion of health service infrastructure is no longer functional. Health services were often targets of violence and looting. Even in 1998, population-to-facility ratios were high. There was one reference hospital for 300,000 people in urban areas and for 160,000 people in rural areas. The official norms are 150,000 and 100,000 in urban and rural areas respectively. Similarly, in 1998 there was reported to be one health center per 100,000 population in urban areas and 60,000 in rural areas, compared to norms of 20,000 and 15,000 respectively. These ratios are significantly higher than other countries in Sub-Saharan Africa.

Figure 3. Doctors and nurses per 100,000 population, DRC 1998



Authors' estimates based on Ministry of Health data.

35. **Higher-skilled health personnel are lacking in numbers and quality, particularly in rural areas.** Data on health personnel are incomplete, but indicate low numbers of higher cadres of health personnel. In 1998, there were around 2,000 doctors reported to be working in the country, for a ratio of physicians per 100,000 population of around 3.6, among the lowest in the world. Nurses are in comparatively greater supply, as there were 27,000 in 1998, for a ratio of around 50 per 100,000 population. This is low, even though not the very lowest in the world. The official norms in DRC are 10 physicians and 20 nurses per 100,000 population.

36. Training infrastructure is in place; there are several medical schools and dozens of technical training schools for nurses and other technical staff. However, like the rest of the system, lack of funding and support has severely compromised the quality of training. Data on the skills and

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quality of health personnel are not available, although anecdotal evidence suggests that the need for in-service training is significant.

37. Human resources are concentrated in Kinshasa, but infrastructure has not kept pace with population growth in the city. For example, the data from 1998 indicate that the ratio of physicians to 100,000 population in Kinshasa is over 10, but less than 2 in the rest of the country. However, it seems that infrastructure has not kept pace with population growth in the capital city, as population to facility ratios in Kinshasa are worse than in other Provinces.

38. Drug supply is fragmented and inefficient although there are recent efforts to develop regional distribution centers. Like other aspects of the system, the withdrawal of Government support in the 1990s left Health Zones and individual facilities with independent responsibility for drug procurement. This resulted in considerable inefficiencies of scale and lack of quality control, as service providers purchased drugs from a wide range of private sellers. In many parts of the country, suppliers are few and costly. At present, a network of regional procurement and distribution centers is being developed, although in many cases service providers continue to purchase from private sources which have lower prices due to an absence of quality control.

39. Other sectors – particularly education, water, sanitation, food security, and transport – have an important impact on health and nutrition. This report focuses on the health sector, but it is recognized that other sectors can have a considerable impact on health and nutrition outcomes. The clear protective effects of mother's education are discussed above. Regression models of the determinants of mortality, morbidity and malnutrition did not reveal clear effects of safe water and adequate sanitation, but it is well-known that such access is essential for good hygiene and health. Malnutrition is largely determined by factors outside the health sector affecting household food security, including economic and agricultural conditions and social protection mechanisms. Another important sector is transport. The lack of roads and means of transportation in many parts of the country exacerbate the poor geographic coverage of the health system, particularly referral services. This has an impact, in particular, on maternal and neonatal mortality, the prevention of which requires accessible and timely delivery and emergency obstetric care. A study of two hospitals in Nord-Kivu found that women living more than 90 minutes walk away were at increased risk of obstetric complications and neonatal mortality. Although health services provide an important lever for working to improve the health-related MDGs, improvement will also depend on progress in these sectors, as well as overall economic and political development.

5. Public financing of health services

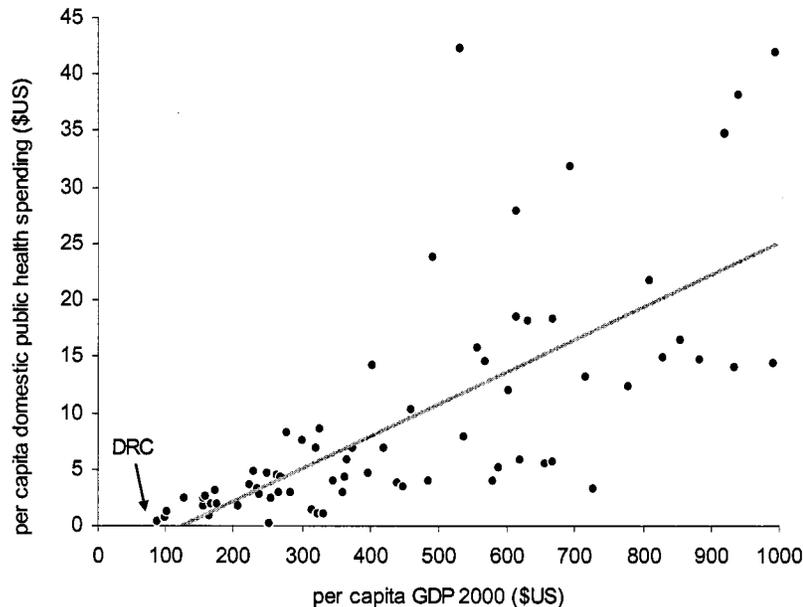
40. Insufficient public funding over the past decade led to deterioration of the health system and left to households almost the entire burden of financing health services. In the 1980s, the country was an innovator in health sector reforms, focusing on primary health care (PHC), integration of referral systems, and decentralization. The development of Health Zones, which integrate PHC and first-referral services under a decentralized administrative structure, represented a partnership between the Government (which was to finance recurrent costs, particularly salaries), the population (which was to largely finance drugs, through revolving drug funds), and external donors (who were to finance investment). This partnership broke down in the early 1990s with severe cuts in Government funding and withdrawal of external aid, leaving households with the main burden of financing services. Health facility staff raised user fees and drug prices in order to finance their remuneration. Financial barriers to care (along with deteriorating quality) caused service utilization to plunge, particularly by the poorest.

41. Government health budgets have increased, but actual execution lags behind. The Government's 2002 IPRSP contains a commitment to allocate at least 15% of the national budget

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to the health sector. The proportion allocated to health in the Government budget has indeed dramatically risen from less than 2% in 2002 to over 7% in 2004. However, only a portion of these budgets have been executed; in 2004, estimated spending was around US\$25 million, compared to the over US\$80 million budgeted. Equivalent to around US\$ 0.40 per capita, this level of domestic public spending on health is among the lowest in the world. (Figure 4)

Figure 4. Domestic public health spending and GDP per capita (countries with GDP per capita under US\$ 1,000)



Authors' estimates from WHO and World Bank data.

42. Nevertheless, increased external support in the coming years, combined with better Government financing, should go some way towards meeting the requirements for achieving progress on the MDGs. It is anticipated the external assistance to the health sector could exceed US\$200 million annually in the coming years. Combined with increased Government spending, total public spending on health could reach US\$4 per capita annually. Although this is some distance from estimates of US\$16 per capita needed to reach the MDGs in other countries in the region, it provides a good start, particularly since the bulk of resources are focused on basic services which address the most important causes of morbidity and mortality. Nevertheless, it is clear that even with high rates of economic growth, significant donor assistance will be required to sustain progress over the long term.

6. Government health sector strategy

43. The Government's overall objectives in the sector are to increase access to primary health care services and control priority diseases. The Government's strategy in the health sector is outlined in its 2002 *Interim Poverty Reduction Strategy Paper (IPRSP)*, which sets the overall objective of increasing access by the poor to primary health care. To achieve this goal, the IPRSP emphasizes development of Health Zones, particularly in rural areas, and supporting disease-specific interventions. Programs to address HIV/AIDS, tuberculosis, malaria, reproductive health, and vaccination, are outlined.

44. External partners support the Government's sector strategy. Much external assistance to the sector, even under humanitarian programs, is in the form of support to basic service delivery

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through the existing structures of the Health Zones. At the same time, a considerable proportion of anticipated external assistance will focus on priority diseases. These are two main pillars of the Government's strategy in the sector.

45. The focus of Government and external partners on basic health care services responds to the enormous health needs of the population. Analysis of the health situation makes clear that the DRC population suffers from an enormous burden of morbidity and mortality from causes which can be prevented and treated at the primary and first-referral levels. The focus of the Government and external donors on basic health services is entirely appropriate, given that, for example, most child mortality is related to malaria, respiratory infection, diarrhea, and malnutrition – all of which can be addressed at the community and primary service levels.

46. Overall, Government strategy and policy provide a good foundation for further development of the system. The Government's emphasis on decentralized service delivery through the Health Zones and its embrace of partnerships with church groups and NGOs are important advantages for reconstruction and development. In particular, these elements are entry-points for external assistance to the sector, with the Health Zone structure and non-governmental actors well-adapted to channeling resources to improve basic service delivery.

47. Functions of the different structures of the Health Zone are well-defined, and essential packages of primary and first-referral services reflect the epidemiological situation and follow international best practice. The health information system has also been well-designed, focusing on a limited set of basic data, although there are significant gaps in implementation.

48. Large gaps remain, with Government and donor support unevenly covering the population. Up to a third of the population lives in Health Zones that receive little or no external support, either from the central Government (except for wages in some cases) or from international donors. Health service quality and utilization therefore remain very low, and the serious health situation unchanged. At the same time, support provided to Health Zones varies widely, with donor assistance ranging from \$US0.70 to \$US5.00 per capita. Although these disparities in many cases respond to differing needs, particularly with regard to humanitarian programs, they more often than not reflect the funding levels, priorities, and modalities of individual donors. As the Ministry of Health's policy and coordination capacity develops, with the cooperation of donors it needs to take more of a lead in improving the coherence of external assistance.

49. As needs are increasingly met among the rural poor, attention should be turned to urban areas. First, although better than in rural areas, the health situation in urban areas of DRC is poor by any standard. For example, the estimated under-five mortality rate in 1997 in urban areas was 158 per 1,000, which is comparable to estimates for Tanzania or Ethiopia as a whole, and exceeds the estimated rate for Kenya. Second, the size of the poor population in urban areas is large and expanding. Kinshasa, where urban poverty is significant, represents at least 12% of the country's population. Consistent with this, current support to the sector includes assistance to urban Health Zones.

50. Current support to basic services largely focuses on primary health care facilities, often neglecting demand factors, community-based approaches, and rural reference hospitals.

First, primary among the demand factors affecting utilization are financial barriers to care. Although for the most part humanitarian programs address this by reducing user fees and highly-subsidizing drugs, most development programs have not grappled directly with the problem, which is of course closely tied to their levels of funding. Uniform strategy and policy may not be possible, nor even desirable given the vastly different contexts in the country, but further study, coordination, and discussion are clearly needed.

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51. Second, although policy on community health workers is in place, this service delivery strategy needs to be better understood and then reinforced in order to reach populations who have poor geographic access to health facilities. Experience in other countries indicates that strengthening of community health interventions should go hand-in-hand with overall support to the primary health care system. Strategies for bringing curative care closer to the population – treatment of respiratory infections may be an example – should be tested.

52. Third, the rural reference hospital is the anchor for the Health Zone, providing referral services as well as supervisory and technical support to the network of PHC facilities. This is the key strength of the integrated Health Zone system. However, current assistance to Health Zones usually includes only limited support to first-referral services, often relating to obstetrics and blood transfusion. First, the cost of providing more extensive recurrent and investment support to existing structures is daunting. Second, the recent expansion of the number of Health Zones implies a significant and costly expansion in the hospital network, since each Health Zone is to have a referral facility. Nevertheless, as primary health care is improved in the coming years, work should start on addressing the needs of these front-line rural hospitals.

53. A large proportion of increased external support will take the form of disease-specific programs, raising the risk of further verticalization of the system. In the past, a plethora of disease and issue-specific departments and programs have developed within the Ministry of Health, often with the impetus of external financing. In the coming years, a third or more of annual external assistance to the sector could be tied to programs addressing specific diseases, HIV/AIDS and malaria in particular. There is a need to forestall fragmentation at both the central and service delivery levels. Rationalization of the Ministry structure as well as effective coordination among the Ministry and external partners are required. Duplicate management, procurement, and information and reporting mechanisms should be forestalled at the central level, while material and staff resource imbalances and inefficiencies at the service delivery level need to be avoided. This requires both leadership from the Ministry and flexibility on the part of external donors. Ideally, the role of disease-specific programs should be as sources of necessary inputs and technical guidance, leaving the details of implementation to the Health Zones.

54. At the same time as supporting basic health services to address the urgent needs of the population, progressively more attention and resources should be devoted to developing the capacities of the system. At present, external support to Health Zones provides resources through NGOs in order to revive basic health services so that the urgent needs of the population are addressed. However, as progress is made, progressively more attention to improving the longer-term capacity of the health system is needed. Health Zone and District authorities need to be more fully involved in allocation and management decisions in order to improve their ownership as well as develop their capacity in these areas. Budgeting, financial management, and personnel management, are particular areas in need of capacity building. At the same time, more focus on developing the technical skills of front-line staff is needed through increased training and technical assistance. In recent years, some donors have supported capacity-building at the central level, but this similarly needs increased attention, particularly to improve the Ministry's leadership and coordination roles.

55. Knowledge and strategy development on health human resources is needed. Policy and strategy in the pharmaceutical area is advancing – and drug supply is mentioned several times in the IPRSP – but little attention has been given to the other key input, health human resources. It is increasingly recognized the human resources are a key constraint to improving and scaling up basic health services in order to achieve progress towards the MDGs in Sub-Saharan Africa. A variety of issues are involved, including civil service and salary reform, public-private partnership, training resources, quality and production, the skill-mix of the health workforce, and

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the health labor market and incentives. Better understanding of such issues is a prerequisite to effective strategy development in the area.

56. Wage levels are a crucial issue related to human resource strategy as well as the Government's overall civil service reform and fiscal decentralization plans. Most domestic public health spending is for wages, and the Government seems to have made progress recently in improving their regular payment. However, the level of health sector wages is universally recognized as too low, so that many health staff are more dependent on supplements provided through external assistance programs than on their official salaries. Developing strategy on wage levels in the sector needs to be part of work on overall human resource strategy, part of the medium-term strategy and costing for the sector as a whole, as well as linked to Government-wide efforts on civil service reform and fiscal decentralization. Reanimating the centralized health personnel system from the past may be an option, but Government should also consider innovative strategic options, for example building on the current autonomy of Health Zones and facilities and on public-private partnerships.

57. Learning and policy work is needed on the health sector's place in the Government's decentralization strategy. This question concerns the place of the health sector in the Government's current plans for fiscal decentralization, which envision a large central role in personnel issues and salary payment, combined with block transfers to decentralized administrations to meet their social service delivery responsibilities. Strategic decisions for the health sector include the extent to which the center should retain control over day-to-day personnel management and salary issues, as well as the extent to which the central level should have control and be directive on the transfers to decentralized structures. A first useful step could be to learn about the decentralization experiences of other countries.

58. There are requirements for developing knowledge, policy, and capacity in a number of other areas related to health care financing. Numerous issues related to health care financing require attention:

- i) Better understanding of public financing flows and mechanisms is required in order to understand and address the current bottlenecks. A related issue is the development of strategic and operational coordination between the Ministry of Health and the Public Service and Finance Ministries.
- ii) Capacity at all levels relating to financing should be developed: at the central and intermediate levels, this relates to overall budgeting and management of public resources, while at the service delivery level, basic budgeting and accounting capacity is required.
- iii) Exemption schemes for the poor – mentioned as a priority in the IPRSP – are a particular area that requires attention.
- iv) Analytical work on community financing schemes is currently being done by an external partner and results should inform Government strategy and policy.
- v) Better data on household out-of-pocket payments is necessary in order to address this key barrier to service utilization.

59. Finally, inter-sectoral coordination is essential to achieving significant progress towards the MDGs. The need for coordination between sectors is often recognized but rarely achieved. In DRC, three sectors in particular are key to improving the health situation – education, water, and transport. The importance of mother's education has been repeatedly shown in the analysis, and this points to not only the role of primary education but also to the necessity of improving health education at the community level. In addition, the technical and university education sector is crucial to health human resource strategy and longer-term development of the system.

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Safe water supply, lacking in many urban and rural areas, is essential to child health in particular. Lack of roads and transport exacerbates the already poor geographical coverage of the health system, having a severe impact on maternal mortality in particular, where delay in reaching emergency obstetric care is fatal. Both the Government and external partners have a role in improving inter-sectoral coordination. A good example in this area is the World Bank's *Emergency Multisector Rehabilitation and Reconstruction Project* which centers support to education, health and other sectors along the reconstruction of *Route Nationale 1*. The benefits of coordinated geographic targeting should be fully exploited at the same time as improving strategic coordination at the policy level.

Introduction

1. Background

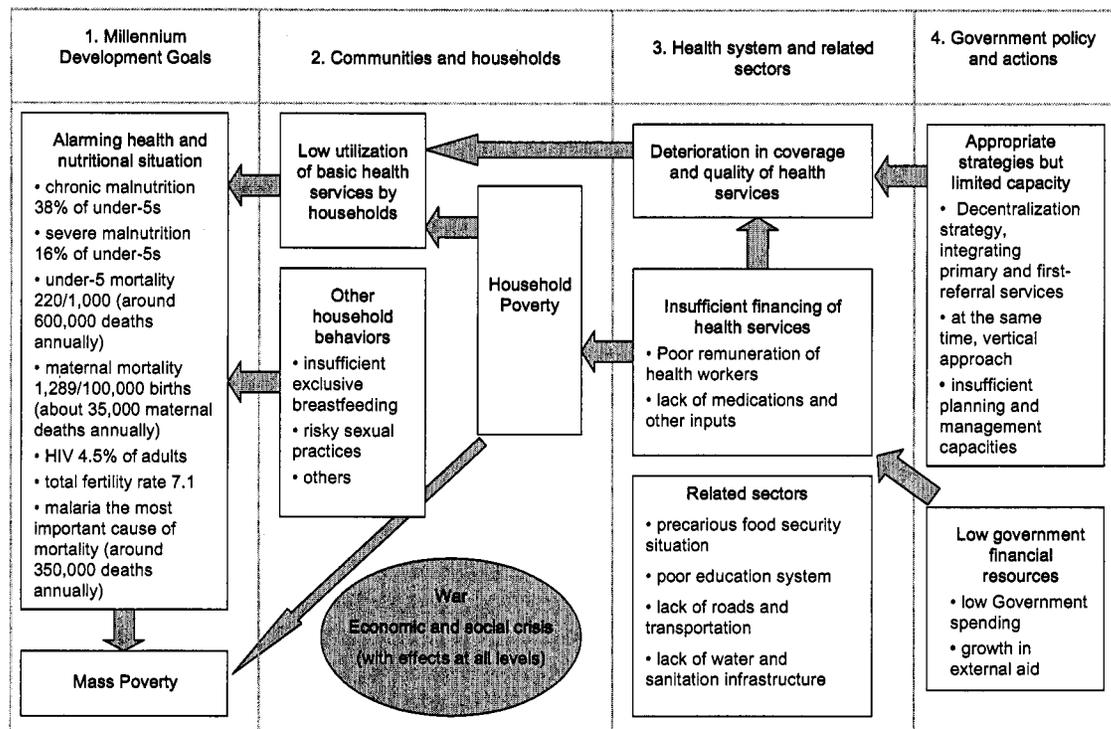
1. After a decade of armed conflict and political instability in the Democratic Republic of Congo (DRC), a peace and reconstruction process has been underway since 2002. However, the preceding war and decades of poor management have contributed to the impoverishment of one of Africa's potentially richest countries. Eighty percent of its population lives on only US\$0.50 per day and the Gross Domestic Product (GDP), at less than US\$100, is among the lowest in the world. With a population of nearly 60 million, the DRC represents an enormous concentration of extreme poverty in the middle of the African continent. The scope of the need, as well as the devastation throughout the DRC, therefore present a real challenge for the Government and the international community, which have tried to mount a response over the past few years.
2. The economic fallout of the conflict, the instability of the macroeconomic framework, and the decline in national production, have affected household purchasing power. Per capita GDP fell from US\$307 in 1970 to US\$167 in 1992, and then to US\$96 in 2002, one of the lowest levels in the world.
3. The effects of the recent conflict on the Congolese population were extreme, and included excess mortality estimated at over 3.8 million lives and the displacement of 2.7 million people over the 1997-2004 period.
4. The low level of social indicators, particularly for health, is indicative of the conflict's catastrophic impact on the living conditions of the population, and particularly on those of the poor and vulnerable. Life expectancy, which stood at 52.4 years in 1994, had fallen to 45 years or less by 2004. Infant, child, and maternal mortality rates rose during the 1990s, and are well above the averages for Sub-Saharan Africa. Diseases, including in particular malaria, malnutrition, and the HIV/AIDS epidemic, further compromise the health status of households.
5. Government services, and particularly social services and basic social infrastructures, gradually collapsed as the State budget in these sectors reached its lowest level in the country's history.
6. Living conditions in the country vary widely depending on the province and place of residence. Of the 11 provinces, those located along the former combat front (i.e., Orientale, Kasaï Occidental, Kasaï Orientale, Katanga) have suffered greatly, while some eastern parts of the country, e.g., Nord Kivu, Sud Kivu and Maniema, are still very unsafe and in the throes of a humanitarian crisis. The provinces of Bandundu and Equateur have specific problems associated with their remoteness. Kinshasa, the administrative and political capital, and Bas-Congo, are somewhat less poor but have large populations that are vulnerable to economic instability.
7. In addition, wide disparities exist within these provinces between rural areas and the more privileged urban milieu. Conditions are particularly dire in conflict-ridden or inaccessible areas, where the interventions of the State and external partners have not yet penetrated.
8. Since 2002, the political situation has improved significantly due to: i) the establishment of a government of national union; ii) the reunification of the national territory; and iii) a plan for making the transition to democratic elections. Progress in implementing economic programs supported by the Bretton Woods institutions also boosted economic growth in 2004. The DRC is eligible for debt relief within the framework of the Highly Indebted Poor Countries (HIPC) Initiative, and is preparing a Poverty Reduction Strategy Paper (PRSP). The Government, with

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donor assistance, has established reform and investment programs aimed at improving living conditions both in Kinshasa and in the provinces, including the most remote.

9. Finally, the Government, in its Minimum Partnership Program for Transition and Recovery [*Programme Minimum de Partenariat pour la Transition et la Relance*, PMPTR] of November 2004, which has been presented to donors, has developed a clear strategy framework setting out priority interventions in all areas in order to rebuild and stabilize the country. Objectives in the health sector, which coincide with the Millennium Development Goals (MDGs) for 2015, focus on: i) revitalization of the 515 Health Districts; and ii) capacity-building at all levels of the health system.

Figure 5. Analytical framework reflecting the situation in the DRC



Adapted from Wagstaff and Claeson (2004)

2. Objectives and analytical framework

10. Within this context, the objective of the present document is to describe, analyze, and evaluate the health status of the population and the health system. Its goal is to provide a basis for decision-making concerning the development and implementation of the Government's sector strategy and policies. In particular, the aim is to highlight the contribution of health interventions to poverty reduction and to focus on the health status of the poorest.

11. The document's secondary objective is to serve as an input to the process of drawing up the PRSP and allocating resources freed up by the HIPC Initiative to the health sector. It is an integral part of efforts by the Government and its partners to achieve the MDGs.

12. This analysis, conducted by the Ministry of Health in collaboration with the World Bank, benefited from the participatory work of the national "Health and Poverty" team composed of representatives of the Ministry, universities, non-governmental organizations (NGOs), and other partners in the sector. A first draft of the document was discussed in May 2004 at the time of the

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Health Roundtables. It has also been the subject of a dissemination workshop and a validation workshop.

13. The analytical framework focuses on the status of, and trends in, health and poverty indicators associated with objectives that the Government set within the framework of the MDGs, which are described and analyzed in Chapter 1 of this report. (See Figure 5 and Table 2).

Table 2. The report's discussion of elements of the analytical framework

Element of analytical framework	Chapter and topic of analysis
1 Millennium Development Goals	1 Health status, nutrition and population
	4 Household health care expenditures
2 Households and communities	1 Factors determining health status
	2 Factors determining utilization of services
	4 Household health care expenditures
3 Health Care System	3 Organization and components of the health system
	2 Utilization of the health system
	4 Financing of the health system
4 Government policies and interventions	3 Organization and components of the health system
	4 Financing of the health system

14. The analysis then tracks the causal chain of measures and interventions that help improve health and poverty indicators. These are then analyzed taking into account the often complex interactions among households' behaviors and resources, socio-economic and demographic characteristics, and the community environment. Utilization of health care services, and the determinants of such use on the part of households and communities, are discussed in Chapter 2.

15. In Chapter 3, the analysis turns to factors associated with the health system and government policies: i.e., organization, standards, role, strengths, and weaknesses of the health system that support households. Chapter 4 analyzes the financing of the sector, including household contributions. Finally, the main conclusions of the analysis are presented, along with the implications for sectoral strategy.

3. Data used and limits of the analysis

16. This report is based primarily on the studies, action plans and documents of the Ministry of Health and on reports generated by the National Health Information System [*Système national d'informations sanitaires*, SNIS]. It was enhanced by data from the national surveys on women and children (Multiple Indicator Cluster Surveys, MICS) conducted by the Government in 1995 and 2001 with the assistance of UNICEF. The analysis draws from numerous studies, some of them national in scope, conducted by non-governmental organizations (NGOs) on mortality levels, trends, and contributing factors. Finally, the report incorporates the results of a large number of ad hoc and local studies, NGO reports presented in the DRC, and a public expenditure review carried out in 2002 by the Government in collaboration with the World Bank.

17. However, the unavailability of some information and the quality of the data presented in the existing documentation impose a limitation on this study, especially where the resources and operation of the health system are concerned. Information on public expenditures is therefore incomplete, and a national household expenditure survey has not yet been carried out in the DRC. The lack of up-to-date basic administrative data on health care facilities, their staff, operations, and performance also imposes limits on the analysis.

Chapter 1: Health Situation and Determinants

1. Millennium Development Goals

1. The Millennium Development Goals (MDGs) were agreed to by world leaders at the UN Millennium Summit in 2000 and reflect the multi-dimensional nature of development. Quantitative indicators and targets have been adopted in order to guide policy and assess progress. Five of the eight MDGs are directly related to nutrition and health, and their indicators and targets provide useful tools for assessing the health, nutrition, and population situation in DRC.

Table 3. Health and nutrition-related MDG indicators, DRC, most recent estimates

	urban DRC	rural DRC	DRC	Sub- Saharan Africa
MDG 1: Poverty and Hunger				
prevalence child malnutrition (underweight) (% under 5)	22	36	31	30
prevalence of child malnutrition (stunting) (% under 5)	29	43	38	41
prevalence child malnutrition (wasting) (% under 5)	12	18	16	10
MDG 4: Child Mortality				
under-5 mortality rate (per 1,000 live births)	158	243	220	174
infant mortality rate (per 1,000 live births)	95	144	128	103
measles immunization (% of children 12-23 months)	65	40	48	58
MDG 5: Maternal Mortality				
maternal mortality ratio (per 100,000 live births)	..	..	1,289	917
births attended by skilled health staff (%)	32	20	24	39
MDG 6: HIV/AIDS, Malaria, and Other Diseases				
prevalence of HIV (% adults aged 15-24)	..	..	4 to 5	7.5
contraceptive prevalence rate (% of women ages 15-49)	..	..	31	23
number of children orphaned by HIV/AIDS	..	..	770,000	12.1M
proportion sleeping under insecticide-treated bednets (% children under-5)	..	..	0.7	2
proportion of children with fever treated with anti-malarials (% children under-5 with fever)	63	47	52	42
incidence of tuberculosis (per 100,000 per year)	..	..	384	358
tuberculosis cases detected under DOTS (%)	..	..	52	..
MDG 7: Environment				
access to an improved water source (% of population)	84	29	46	58
access to improved sanitation (% of population)	61	39	46	54
General Indicators				
population	..	..	58.3 M	689 M
total fertility rate (births per woman ages 15-49)	6.3	7.4	7.1	5.1
life expectancy at birth (years)	..	..	45.3	45.8

Sources are 2001 MICS2 in DRC, UNAIDS (2004), World Bank (2004a), World Bank (2004b).

2. Most health-related MDG indicators in DRC are worse than Sub-Saharan Africa averages, with levels of child and maternal mortality among the highest in the world. Table 3 presents estimates for the various MDG indicators for the country, for rural and urban areas, as well as comparisons with regional averages for Sub-Saharan Africa. In general, DRC performs

quite poorly, and of particular concern are the levels of child and maternal mortality. Estimates for DRC are lower than the regional average on many of the other MDG indicators such as measles immunization, skilled delivery care, and access to safe drinking water and adequate sanitation.

3. Chronic child malnutrition is comparable to the average level in Sub-Saharan Africa, but acute malnutrition is much higher, reflecting the impact of the conflict. Estimated access to anti-malarial medication is higher than the Sub-Saharan Africa average,² and the prevalence of adult HIV is also lower than the estimated average for Sub-Saharan Africa. The latter is perhaps related to the isolation of the large rural populations in DRC, but could also be due to the range of uncertainty around such estimates.

Table 4. Selected health-related MDG indicators, DRC and comparator countries

	DRC	Ethiopia	Kenya	Nigeria	Tanzania
population 2004 (million)	58.3	71.3	33.0	125.8	36.1
gross national income (GNI) per capita 2003 (\$US)*	100	90	390	320	290
under-5 malnutrition (stunting) (%)	38	52	30	38	44
under-5 mortality (per 1,000)**	216	166	115	201	147
measles immunization (% 12-23 months)	48	52	78	40	89
maternal mortality (per 100,000 live births)***	1,289	871	414	800	1,500
skilled birth attendance (% deliveries)	24	6	..	42	36
adult HIV prevalence (%)	4.2	4.4	6.7	5.4	8.8

* Atlas method

** The estimate for DRC is from an indirect method (Brass) while estimates for comparator countries are from direct methods (birth histories).

*** The estimate for DRC is from an indirect method (Sisterhood) while those for Ethiopia and Kenya are direct estimates and the those for Nigeria and Tanzania are from a model.

Sources are 2001 MICS2 in DRC, AbouZahr and Wardlaw (2001), Measure DHS (2004), UNAIDS (2004), US Census Bureau (2004), World Bank (2004a), World Bank (2004b).

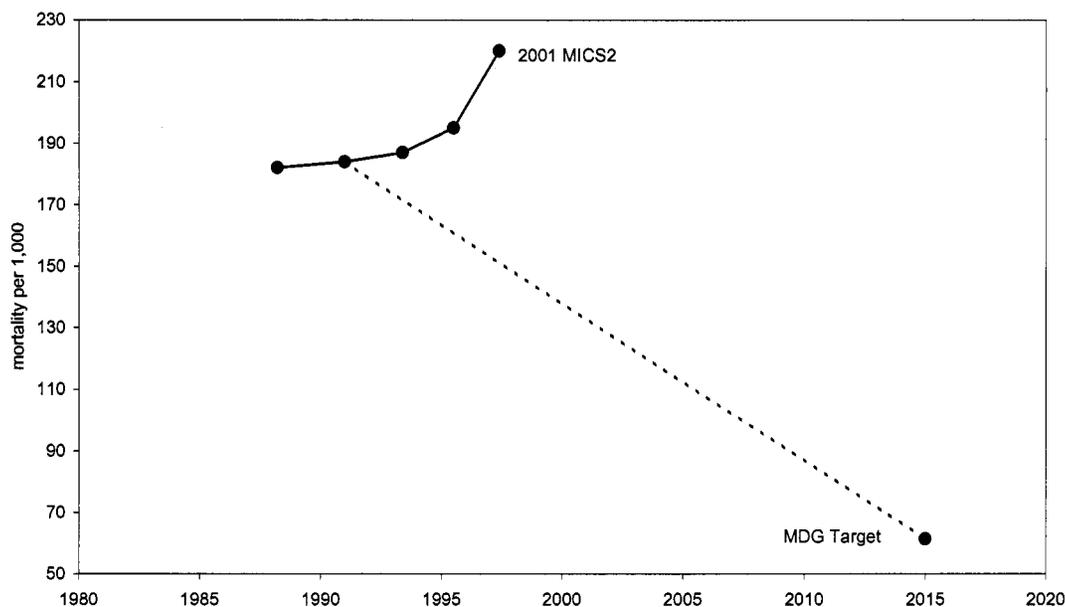
4. **In general, MDG indicator levels in DRC are worse than the very poor situation observed in other large and poor countries in Sub-Saharan Africa.** Table 4 compares selected MDG indicator estimates in DRC with other countries in Sub-Saharan Africa with large populations. It should be noted, however, that only Ethiopia is as poor as DRC, since Kenya, Nigeria, and Tanzania are estimated to have average per capita incomes three times larger or more. Indicators in the comparator countries that are worse than the DRC estimates are given in bold text in the table. The maternal and child health situation in DRC is generally worse than the other countries, as DRC has the highest estimated rate of under-five mortality, the second-lowest rate of measles immunization, the second highest estimated maternal mortality, and the second lowest rate of skilled delivery care.³ Note that given the uncertainty intervals around estimates of maternal mortality ratios, all of these countries (except perhaps Kenya) suffer from very high levels of maternal mortality. In fact, most of the indicator levels in these countries are in the same order of magnitude – very poor.

² The estimates for chronic malnutrition and access to anti-malarials seem to be contradictory with the very high rate of child mortality. Possible explanations are discussed elsewhere in the report, and in all cases may include possible problems with the data. With regard to chronic malnutrition, explanations may include regional patterns of malnutrition and mortality as well as survivor bias, both associated with the conflict. With regard to access to anti-malarials, an explanation may involve increasing parasite resistance to the most commonly-used drugs.

³ The DRC under-5 mortality estimate is from the indirect method and the others derived from the direct method, so they cannot be considered comparable. However, other evidence, discussed below, indicates that child mortality in DRC is indeed extremely high.

5. **Due to the crisis experienced by DRC over the past decade, the country has seen little or no progress towards the 2015 MDG targets.** Monitoring the performance of DRC on the MDG indicators over time is limited due to the paucity of data. Unsurprisingly, given the crisis experienced by the country in recent years, the available information suggests that DRC has made little or no progress towards the MDG targets. Trends in health outcomes are discussed further below. Like many other countries in Sub-Saharan Africa, achieving the MDGs by 2015 is unlikely in DRC, although progress towards them is of course possible with considerable effort and investment.

Figure 6. Indirect estimates of under-five mortality, DRC



Authors' estimates from 2001 MICS2 data.

2. Child mortality

6. **Overall, DRC experiences one of the highest child mortality rates in the world, with at least one in five children dying before the age of five years.** The 2001 MICS2 household survey collected data (on each sampled woman's number of children ever born and number still alive) which can be used to derive indirect estimates (using the Brass method) of child mortality. Figure 6 shows the under-five mortality estimates from this survey with the time periods to which they refer. It is estimated that under-five mortality in the 1997-98 period was 220 per 1,000.⁴ Such a mortality rate translates into the deaths of 450,000 to 500,000 children per year. Estimated infant mortality (children under one year old) is 128 per 1,000, indicating that over one in ten infants die before their first birthday.

7. Non-governmental organizations (NGOs) have conducted a number of retrospective mortality surveys which provide direct estimates of child mortality based on the recall of family members. Table 5 provides estimates from population-representative retrospective mortality surveys conducted between 2002 and 2003. Crude mortality rates are measured, but to ease

⁴ The estimate is from sample-weighted data, using the North family of model life tables, and based on the mortality experience of women aged 25-29, considered most reliable. (The child mortality experience of younger women is usually higher than average due to confounding by the lower than average economic status of women who have children at younger ages).

comparability, these have been translated into implied under-five mortality rates, or the risk of death between the exact ages of 0 and 5 years (${}_5q_0$).⁵

Table 5. Under-five mortality estimated from population-representative retrospective mortality surveys, DRC

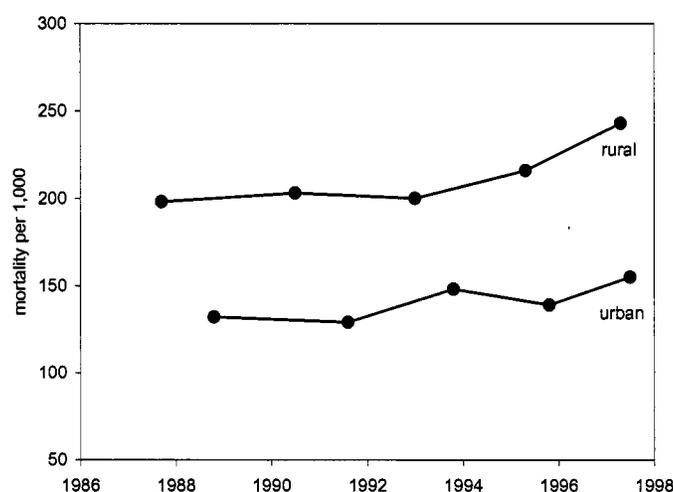
recall period	location	NGO	crude mortality rate (per 10,000 per day)	crude mortality rate (per 1,000 per year)	implied under-5 mortality rate (${}_5q_0$) (per 1,000)*
Jan. 02 - Oct. 02	non-conflict-affected areas	IRC	1.4	53	228
Jan. 02 - Oct. 02	conflict-affected areas	IRC	3.0	108	408
Jan. 02 - Oct. 02	overall**	IRC	1.7	64	267
Jan. 03 - Apr. 04	non-conflict-affected areas	IRC	1.3	48	210
Jan. 03 - Apr. 04	conflict-affected areas	IRC	1.9	70	288
Jan. 03 - Apr. 04	overall**	IRC	1.7	61	259

* The mortality that would be experienced by a birth cohort during its first five years if the measured crude mortality rate were to prevail over the five years.

** not reported, but estimated by the authors on the basis of information in the IRC report

8. The most recent estimate for the country as a whole refers to 2003 and part of 2004 and implies an under-five mortality rate of 259 per 1,000.

Figure 7. Indirect estimates of under-five mortality, urban and rural areas, DRC



Authors' estimates from 2001 MICS2 data.

⁵ A crude mortality rate is the measured mortality during a defined recall period. The implied under-five mortality rate (${}_5q_0$) is the mortality that would be experienced by a birth cohort over five years if the measured crude mortality rate were to prevail for the five years. The translation is done with the formula

$${}_5q_0 = \frac{nm}{1 + (n - a)m}$$

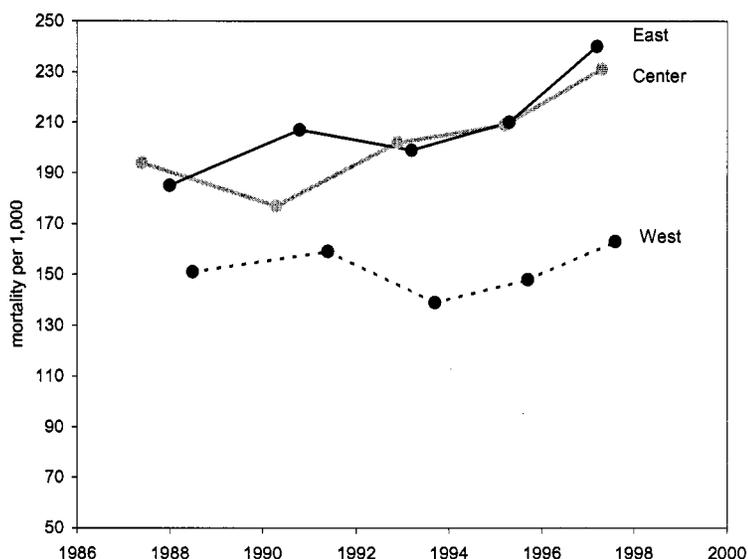
where n = the number of years in the interval (5 years), m = the observed crude mortality rate for one year, and a = the average number of years lived by those who died during the interval (assumed to be 2). (Preston, Heuveline, and Guillot, 2001)

9. Infant mortality estimates from the 2004 retrospective mortality survey are 150 per 1,000 live births in the conflict-affected half of the country and 97 per 1,000 in the part not affected by conflict, for an overall average of around 115 per 1,000.

10. **Child mortality has risen dramatically in the past decade.** The target for the fourth MDG is to reduce child mortality by two-thirds between 1990 and 2015. However, child mortality increased during the 1990s in DRC, implying that the country has lost a decade in the effort to achieve progress towards this goal. The indirect estimates from the MICS2 survey described in Figure 6 show an increasing trend in under-five mortality since the mid-1980s. The MICS2 estimate of 220 per 1,000 for 1997-98 can be compared to the indirect estimate from the 1995 MICS1 of 192 per 1,000, referring to the period 1991-92.

11. The estimates from retrospective mortality surveys indicate continuing deterioration during the years of intense conflict, starting in 1997, with overall estimates for the country in the range of 250-270 per 1,000. (Table 5).

Figure 8. Indirect estimates of under-five mortality, by regions, DRC



Authors' estimates from 2001 MICS2 data.

12. **Child mortality is higher and has increased faster in rural areas.** Figure 7 shows indirect estimates of under-five mortality in urban and rural areas from the 2001 MICS2. Estimated mortality for the period around 1997 is significantly higher in rural areas (243 per 1,000 in 1997) than in urban areas (158 per 1,000). Mortality has also increased significantly in rural areas since the early 1990s, while there has been a slight increasing trend in urban areas.

13. **The rise in child mortality in DRC was concentrated in conflict-affected regions.** The rise in child mortality in rural areas was driven by large increases in parts of the country affected by the conflict. Figure 8 shows indirect under-five mortality estimates for different regions of the country: East (Province-Orientale, Maniema, Nord-Kivu, and Sud-Kivu), Center (Equateur, Kasai-Oriental, Kasai-Occidental, and Katanga), and West (Kinshasa, Bas-Congo, and Bandundu).⁶ During the war, the West group of Provinces was not directly affected, the front line went through the Center, and the East was the scene of much fighting. Figure 8 shows that the western Provinces have consistently experienced lower levels of mortality, although there was a

⁶ These regions are defined for the purpose of the analysis and do not reflect any administrative divisions.

Chapter 1: Health Situation and Determinants

steady increase during the 1990s, with an estimate of 163 per 1,000 for 1997. Child mortality in the rest of the country increased more dramatically in the 1990s to estimates for 1997 of 231 per 1,000 in the central Provinces and 240 per 1,000 in the East. This indicates that the regional trends in mortality were evident before the war started in 1998.

Table 6. Crude mortality and implied under-five mortality rates (s_{q0}), specific locations, DRC

recall period	location	NGO	crude mortality rate (per 10,000 per day)	crude mortality rate (per 1,000 per year)	implied under-5 mortality rate (s_{q0}) (per 1,000)*
Jan. 98 - Feb. 99	Katana (Sud-Kivu)	IRC	3.3	121	444
Jan. 99 - Apr. 00	Katana (Sud-Kivu)	IRC	2.3	83	332
Jan. 99 - Apr. 00	Kabare (Sud-Kivu)	IRC	1.9	70	288
Jan. 99 - May 00	Moba (Katanga)	IRC	8.1	294	781
Jan. 99 - Apr. 00	Kisangani (Province-Orientale)	IRC	1.6	58	246
Jan. 00 - Mar. 01	Kalemie (Katanga)	IRC	3.6	130	467
Jan. 00 - Mar. 01	Kalima (Maniema)	IRC	2.5	90	354
Jan. 00 - Feb. 03	Katana (Sud-Kivu)	IRC	4.2	155	529
Jan. 00 - Apr. 01	Lubunga (Province-Orientale)	IRC	2.3	83	332
Jan. 00 - Mar. 01	Lusambo (Kasai-Oriental)	IRC	3.3	120	441
Jan. 00 - Mar. 01	Kabare (Sud-Kivu)	IRC	1.8	67	280
Jan. 01 - Oct. 01	Kimpangu (Bas-Congo)	MSF	2.0	73	299
Jan. 01 - Oct. 01	Inongo (Bandundu)	MSF	1.0	37	164
Jan. 01 - Aug. 01	Basankusu (Equateur)	MSF	6.6	241	699
Jan. 01 - Sep. 01	Lisala (Equateur)	MSF	1.8	66	274
Jan. 01 - Oct. 01	Kilwa (Katanga)	MSF	3.1	113	422
May 01 - Jul. 01	Malemba-Nkulu (Katanga)	ACF	10.4	380	887
Mar. 02 - Jun. 03	Bosobolo (Equateur)	Epicentre	3.9	142	499
Mar. 02 - Jun. 03	Zongo/Libenge (Equateur)	Epicentre	5.5	201	626
Oct. 03 - Dec. 03	Bolomba (Equateur)	ACF	4.9	178	581
Nov. 03 - Jan. 04	Befale (Equateur)	ACF	2.5	89	353
Dec. 03 - Feb. 04	Basankusu (Equateur)	ACF	3.2	117	432

* The mortality that would be experienced by a birth cohort during its first five years if the measured crude mortality rate were to prevail over the five years.

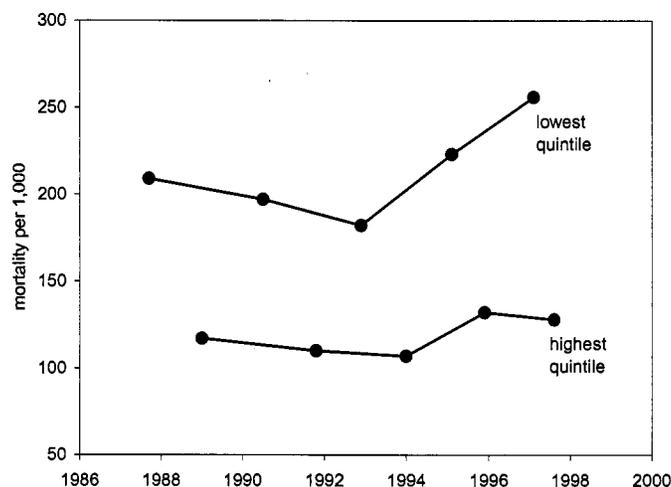
Table 7. Implied under-five mortality rates (s_{q0}), specific locations, DRC

	1998-99	1999-2000	2000-01	2002	2003-04
Katana (Sud-Kivu)	201	162	250	107	127
Kabare (Sud-Kivu)					
Kalemie (Katanga)			467	219	191
Kalima (Maniema)			354	162	196
Moba (Katanga)		506			177
Kisangani (Province-Orientale)		158		304	75
Basankusu (Equateur)			699		432

Authors' estimates based on NGO reports.

14. The effects of the war on mortality since that time are clear from the findings of retrospective mortality surveys presented in Table 5. Separate samples were taken from areas directly affected by the war (the eastern Provinces and parts of the central Provinces) and those not directly affected (the western Provinces and parts of the central Provinces). The implied under-5 mortality rate in the conflict-affected half of DRC in 2002 was 408 per 1,000, compared to 228 in the rest of the country.

Figure 9. Indirect estimates of under-five mortality, lowest and highest SES quintiles, DRC



Authors' estimates from 2001 MICS2 data.

15. Extremely high rates of child mortality have been experienced by many conflict-affected and other populations. The implied under-five mortality rate of 408 per 1,000 observed in the eastern half of the country in 2002 (Table 5) is exceptionally high. It means that if the observed crude mortality rates during 2002 prevailed during the first five years of life of a birth cohort, 40% of them would die before reaching their fifth birthday.

16. Table 6 presents crude mortality estimates from retrospective mortality surveys in specific locations during the war. Such estimates are often presented in humanitarian situations as rates per 10,000 per day to enable comparison with a standard of 2 under-five deaths per 10,000 per day which is taken as the threshold for an emergency situation. Many of the situations presented in Table 6 experienced crude under-five mortality rates well above that. For example, in parts of Sud-Kivu, western Katanga, and parts of Equateur, crude mortality was such that 15 to 30% of under-five children could have been expected to die in just one year. Some recent surveys in Equateur Province show continuing high crude mortality, equivalent to under-five mortality rates (*sqo*) of 300-500 per 1,000.

17. There are signs of improvement in many locations in the past few years, but mortality remains high. The recent population-representative retrospective mortality surveys described in Table 5 indicate that the overall child mortality situation is starting to improve since the beginning of the peace process. Under-five mortality has significantly decreased in the war-affected areas (from an implied rate of 408 per 1,000 in 2002 to 288 in 2003-04), with a smaller decline in the rest of the country (from an implied rate of 228 per 1,000 in 2002 to 210 in 2003-04). Nevertheless, such rates are still high by any standard. Table 7 presents implied under-five mortality rates from retrospective mortality surveys done at different times in the same locations, also indicating that the situation is improving. For example, the Katana Health Zone in Sud-Kivu has been surveyed four times since 1999, showing an increase in child mortality until 2001, after which a significant improvement is evident.

Box 1. Measuring Socio-Economic Disparities in Health

For this analysis, in the absence of conventional consumption or income indicators for household economic status, a relative index of economic status is estimated from available survey data on assets and living standards. (Filmer and Pritchett, 2001)

Concentration curves and indices are used to measure health inequalities. (Wagstaff, 2000) These are analogous to the Lorenz curves and Gini coefficients used to analyze income inequality. A concentration curve plots the cumulative share of the outcome in question against the cumulative proportion of the population possessing that outcome, with the population ranked by the economic status index. The diagonal represents perfect equality in the distribution of the outcome over all levels of economic status. Distance from the diagonal measures the extent of inequality. A concentration curve above the diagonal indicates that the outcome is concentrated among poorer people, while a curve below the diagonal indicates that it is concentrated among the better-off.

The concentration index provides a quantitative measure of this inequality and is equivalent to twice the area between the concentration curve and the diagonal. On the diagonal, the concentration index is 0. A negative concentration index indicates a curve above the diagonal, where the outcome is more concentrated among poorer people, while a positive index indicates a curve below the diagonal, where the outcome is concentrated among the better-off. A concentration index of -1 would (unrealistically) indicate that the outcome is completely concentrated among the poorest, while an index of $+1$ would represent complete concentration among the better-off.

18. There are large and increasing disparities in the child mortality experiences of the poorest and the most well-off. Box 1 provides details on the methodologies for measuring socio-economic inequalities in health applied here to the available household survey data. Figure 9 compares indirect under-five mortality estimates for the lowest and highest socio-economic status (SES) quintiles from the 2001 MICS2 data. It suggests that until the mid-1990s, child mortality was decreasing among both the poorest and the better-off, and even that disparities were narrowing. However, since then, it seems that child mortality increased among both the poorest and better-off, rising at a much faster rate among the poorest.⁷ In 1997-98, the estimated under-five mortality rate experienced by the poorest quintile was 256 per 1,000, compared to 128 among the highest quintile.

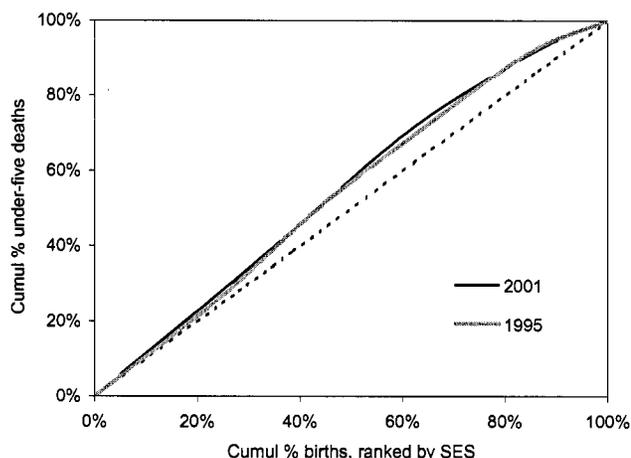
19. Although the most well-off experience less child mortality, but there is little difference over the rest of the socio-economic scale, suggesting a situation of mass poverty and widespread vulnerability. Figure 10 shows the concentration curves for child mortality in 1995 and 2001. The curves are relatively flat, indicating that the child mortality experience of most households is similarly high – suggesting a situation of mass poverty and vulnerability. Despite the increasing disparity between the lowest and highest quintiles shown in Figure 9, based on the 2001 MICS1 data, Figure 10, which draws on both the 1995 and 2001 surveys, indicates virtually no change in the socio-economic distribution of child mortality between 1995 and 2001. This may indicate that over most of the socio-economic scale, there was little change in conditions during that period. The estimated concentration index for 1995 is -0.09 and -0.10 for 2001.

20. Regression models confirm the importance of the main determinants of child mortality, but present a complex picture of change over time in their strength. Table 8 reports estimates from poisson regression models of the determinants of mothers' reported number of children dead based on data from the 2001 MICS2. These models control for the reported number of children born (the exposure variable). Because mortality can be highly clustered, the models are estimated in a way which accounts for the variation (random effects) between sample clusters that is not explained by the variables included in the models. The first model examines

⁷ Such conclusions about trends require the assumption that socio-economic status measured in 2001 was similar in the past for the households in the sample (ie. that there was little upward or downward mobility).

the determinants of reported mortality among children born in the five years prior to the survey, while the second model refers to children born before five years prior to the survey. These models allow both an overall assessment of the importance of different determinants of mortality as well as provide indications about how this may have changed over time.⁸

Figure 10. Concentration curves for child mortality, DRC, 1995 and 2001



Authors' estimates from 1995 MICS1 and 2001 MICS2 data.

Table 8. Random-effects poisson regression models of the determinants of mothers' reported number of children dead, DRC, 2001

	number dead among children born in previous 5 years (n = 6,781 mothers)		number dead among children born before 5 years previously (n = 4,692 mothers)	
	incidence rate ratio	p-value	incidence rate ratio	p-value
mother's age (years)*	1.00	0.44	0.99	0.00
mother's age ²	1.00	0.80	1.00	0.02
household size*	0.91	0.00	0.92	0.00
household size ²	1.01	0.00	1.01	0.00
1 = mother has any education	0.96	0.54	0.85	0.00
1 = highest SES quintile	0.82	0.12	0.79	0.00
cluster proportion BCG vaccination	0.56	0.30	0.32	0.00
1 = improved water supply	1.02	0.79	0.98	0.67
1 = adequate sanitation	0.83	0.01	0.96	0.27
1 = urban	0.77	0.03	0.84	0.00
Center	1.38	0.01	0.98	0.68
East	1.60	0.00	0.96	0.44

* centered at the mean

Center = Equateur, Kasai-Occidental, Kasai-Oriental, and Katanga. East = Province-Orientale, Maniema, Nord-Kivu, and Sud-Kivu. Reference region is West = Bas-Congo, Kinshasa, and Bandundu.

Authors' estimates from 2001 MICS2 data.

⁸ Coefficients measure the ratio of incidence of mortality associated with each determinant to the incidence associated with the reference group (in the case of dichotomous variables, the reference group is the absence of the determinant; in the case of continuous variables, the reference is one unit decrease in the variable).

21. Table 9 provides another way of looking at these questions, modeling pooled data from the 1995 and 2001 MICS on child mortality reported by women aged under 35. The coefficient on the *Time* variable measures the ratio of the incidence of mortality in 2001 over the incidence in 1995, after controlling for change in the various determinants. The coefficients on the variables without interactions measure the risk of mortality associated with the different determinants in 1995. The coefficients on the variables with interactions (with the *Time* variable) estimate the change over time (from 1995 to 2001) in the risk associated with these determinants in question. The analysis is stratified by region. Statistically-significant estimates ($p < 0.1$) are in bold text.

22. **Although safe water and adequate sanitation are known to be beneficial to child health and nutrition, protective effects are overall not evident in the models.** The models measure the association between child mortality and access to an improved water source (for example covered well or spring) and adequate sanitation (for example covered latrine). However, such correlations are not evident in the models, except in relation to recent mortality (the first model of Table 8). This may suggest that access to adequate sanitation may have become more important in recent years, but such effects are not statistically significant in the models pooling 1995 and 2001 data for the different regions. (Table 9).

Table 9. Pooled random-effects poisson regression model of the determinants of mothers' reported number of children dead, DRC, 1995 and 2001 (mothers 15-34 years)

	West (n = 2,492 mothers)		Center (n = 3,507 mothers)		East (n = 2,324 mothers)	
	incidence rate ratio	p-value	incidence rate ratio	p-value	incidence rate ratio	p-value
<i>Time</i> : 0 = 1995, 1 = 2001	1.07	0.79	1.11	0.46	1.02	0.90
mother's age (years)*	1.02	0.03	1.03	0.00	1.01	0.04
mother's age ²	1.00	0.82	1.00	0.11	1.00	0.32
household size*	0.94	0.00	0.95	0.00	0.93	0.00
household size ²	1.00	0.00	1.00	0.00	1.01	0.00
1 = mother has education	0.92	0.53	0.80	0.01	0.88	0.19
mother's education interaction with <i>Time</i>	0.73	0.06	1.11	0.30	1.07	0.58
1 = highest SES quintile	0.63	0.10	0.94	0.74	0.63	0.10
quintile interaction with <i>Time</i>	1.53	0.18	0.51	0.02	1.00	0.99
cluster proportion BCG vaccination	1.11	0.75	0.52	0.00	0.68	0.08
cluster proportion BCG interaction with <i>Time</i>	0.56	0.43	0.31	0.03	0.25	0.01
1 = improved water source	0.84	0.26	1.18	0.14	0.86	0.36
improved water source interaction with <i>Time</i>	1.27	0.21	0.85	0.22	1.16	0.42
1 = adequate sanitation	0.82	0.38	0.88	0.38	1.09	0.61
adequate sanitation interaction with <i>Time</i>	1.11	0.67	1.14	0.39	0.80	0.24
1 = urban	0.73	0.13	0.96	0.77	1.06	0.75
urban interaction with <i>Time</i>	1.10	0.68	0.81	0.19	0.75	0.22

* centered at the mean

Authors' estimates from 1995 MICS1 and 2001 MICS2 data.

23. **In general, even after controlling for economic status, mother's education is associated with decreased risk of child mortality, but this protective effect seems to have declined in war-affected areas.** In many contexts, mother's education has consistently been shown to be beneficial for child health, even after considering household economic status. Overall, these models also measure this relationship in DRC, but indicate that mother's education became less important as a protective factor during the war. The risk of mortality among children born before 1996 is 0.85 times lower when the mother has any education, but this effect is not evident among children born more recently. (Table 8) This suggests that the war reduced the protective effect of mother's education; that is, the benefits accorded by mother's education could not operate in

conditions of conflict. Such an interpretation is supported by the pooled models (Table 9), where the protective effect of mother's education increased in the West, but decreased (or did not significantly change) in the Center, and was not evident in the East.

24. In general, death of a child is less likely to occur in urban areas. Differences in health outcomes between urban and rural areas are related to differences in water and sanitation conditions, service availability, poverty levels, and other factors. However, even after holding such determinants constant, analyses in many contexts usually show a benefit associated with urban residence. This is the case with both models of the 2001 MICS2 data (Table 8), where urban residence is associated with decreased risk of mortality among children born during either of the two time periods. This confirms the urban-rural differences in estimated under-five mortality shown in Figure 7 above. However, the effect is not as clear in the regionally-stratified analyses pooling 1995 and 2001 data. The coefficients associated with urban residence are not statistically significant, although their directions suggest that the protective effect diminished in the West, but increased in the Center and East. (These effects have greater statistical significance when the water and sanitation variables are not included in the models).

25. In general, the poor experience greater risk of child mortality, while change over time in the protective effect of socio-economic status shows complex regional patterns. The models of the 2001 MICS2 data (Table 8) show that children in the highest SES quintile born before 1996 had 0.79 times the risk of mortality as other children. A similar protective effect may be seen among children born more recently, although it is not quite statistically significant. These findings are consistent with the comparison of under-five mortality estimates for the lowest and highest quintiles presented in Figure 9. Other models (not shown) indicate that the relationship between socio-economic status and child mortality is not as evident among the lower four quintiles, also consistent with the previous discussion.

26. The pooled models of the 1995 and 2001 data (Table 9) indicate that higher socio-economic status was similarly protective in 1995, particularly in the West and East. However, the models suggest that this protective effect may have diminished in the West (although the change is not statistically significant), but remained stable in the East and was accentuated in the Center. This may suggest that the indirect economic and social effects of the war undermined the advantages of higher socio-economic status in the West, but the direct effects of the war may have accentuated them, particularly in the central Provinces.

27. An indicator of access to health services is associated with decreased risk of child mortality, and this effect increased over time in war-affected regions. Absent direct data on availability of health services, the proportion of children vaccinated with BCG in each sample cluster is used as an indicator of access to health services. This indicator is associated with significantly decreased risk in mortality among children born before 1996. Among children born more recently, the direction of the coefficient is consistent with a protective effect, but it not statistically significant. (Table 8) The pooled analysis of 1995 and 2001 data (Table 9) indicate that the protective effect associated with this indicator of access to health services was significant in 1995 in the Center and East of the country, and increased over time in these regions. Coefficients in the model for the West were not statistically significant. This suggests that the effects of health services became more important among populations affected by the war.

28. The models confirm that increased child mortality in recent years was concentrated in the Center and East of the country, regions most directly-affected by the war. The 2001 MICS2 data show that the risk of mortality among children born since 1996 was 1.60 times higher in the East than in the West of the country and 1.38 times higher in the Center than in the West, holding a range of other determinants constant. (Table 8) This effect is not evident among

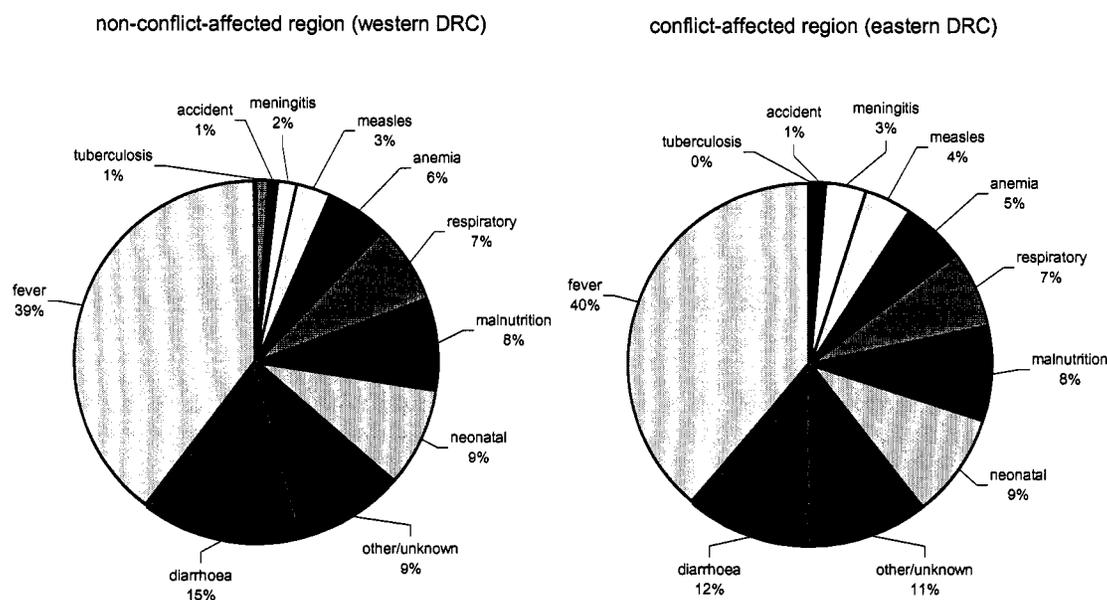
children born earlier, perhaps because regional differences were more due to factors included in the model, such as differences in socio-economic status or access to health services.

29. In sum, the models suggest that in the West, the economic and social crisis of recent years diminished the importance of household socio-economic status to child health, but increased the protective effects of mothers' education. In the Center and East, directly-affected by the war, the protective effect of higher socio-economic status did not change while the importance of mothers' education diminished, and the beneficial effect of access to health services was accentuated.

3. Child illness

30. Malaria, diarrhea, respiratory infections, malnutrition, and measles are the main causes of child mortality in DRC. Figure 11 presents reported causes of death among under-five children from a retrospective mortality survey done in the western and eastern halves of the country in 2004. It shows that the pattern of causes of child mortality in DRC is similar to other poor countries in Sub-Saharan Africa, with most child deaths caused by malaria, respiratory infections, diarrhea, and measles, often associated with malnutrition. Although fever could accompany different types of infection, the fact that it is reported to have been present in 40% of child deaths testifies to the heavy burden of malaria in the country.

Figure 11. Reported causes of under-five deaths, DRC, 2003-04



Source is IRC (2004).

31. The conflict has increased mortality by accentuating children's vulnerability to malnutrition and disease. As discussed above, these retrospective mortality surveys found significantly higher child mortality in the eastern half of the country, directly affected by the conflict. The fact that the pattern of morbidity suggested by Figure 11 is very similar to the western half of the country indicates that the conflict did not cause child deaths directly through violence but by undermining household socio-economic status and coping mechanisms, as well as affecting social conditions, including access to health services.

32. Models of the determinants of child morbidity confirm that the epidemiological pattern of disease and other environmental factors are important. Table 10 presents estimates from logistic regression models of data from the 2001 MICS on the determinants of reported fever, respiratory infection, and diarrhea among under-five children. Because morbidity is clustered, random-effects models account for variation between sample clusters not explained by the variables included in the models. Indeed, quite high proportions of the variation in the outcomes (10% to 30%) can be attributed to between-cluster variation not explained by the observed variables. This is consistent with the fact that disease patterns have important environmental causes.

Table 10. Random-effects logistic regression models of the determinants of reported fever, respiratory infection, and diarrhea in the previous two weeks among under-five children, DRC, 2001 (n = 10,254)

	fever		respiratory infection		diarrhea	
	odds ratio	p-value	odds ratio	p-value	odds ratio	p-value
child's age (months)*	1.00	0.00	0.99	0.00	0.97	0.00
child's age ²	1.00	0.00	1.00	0.00	1.00	0.00
1 = male	1.02	0.65	1.09	0.25	1.15	0.01
household size*	1.01	0.25	0.99	0.59	1.01	0.35
mother's age (years)*	1.00	0.16	1.00	0.98	0.99	0.01
1 = mother has education	1.18	0.00	0.98	0.79	1.00	0.98
1 = highest SES quintile	0.97	0.77	0.62	0.00	0.70	0.00
cluster proportion BCG vaccination	0.35	0.08	1.61	0.64	0.91	0.87
1 = improved water supply	0.94	0.41	0.98	0.88	1.01	0.87
1 = adequate sanitation	1.02	0.77	1.29	0.01	1.01	0.92
1 = urban	0.80	0.07	0.73	0.18	1.01	0.96
Center	1.11	0.42	1.94	0.01	1.28	0.03
East	1.07	0.61	3.75	0.00	1.07	0.57
% variation associated with cluster	14%		31%		9%	

* centered at the mean

Reference region is West.

Estimation of significance accounts for survey design.

Authors' estimates from 2001 MICS2 data.

33. Risk of fever seems to be largely independent of socio-economic factors, likely varying according to the epidemiological pattern of malaria, although there is evidence that access to health services makes a difference. The 2001 MICS found that 41.9% of under-five children had fever in the previous two weeks, and Figure 11 shows that fever is by far the most commonly reported cause of child deaths. Because most fevers are associated with malaria, the incidence of fever depends greatly on the epidemiological pattern of the disease. The risk of fever is lower in urban areas, suggesting that malaria is less present. The model shows that the main socio-economic factors do not have an impact on the risk of fever. In fact, mother's education is unexpectedly associated with an increase in the risk of fever. On the other hand, the indicator of access to health services shows a statistically significant protective effect, associated with a lower risk of fever.

34. Respiratory infection shows more sensitivity to socio-economic factors, with children from poor families experiencing higher risk of disease. The 2001 MICS2 found that 10.3% of under-five children had a respiratory infection in the previous two weeks. The model of the determinants of respiratory infection indicates that under-five children in the highest SES quintile are at considerably reduced risk. However, other models (not shown) indicate that differences among the lower four quintiles are not evident, consistent with the patterns seen with child

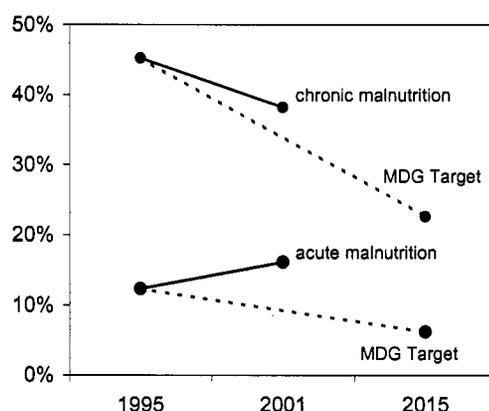
mortality, and indicative of socio-economic homogeneity among the mass of the population. The model also indicates that children in the central and eastern Provinces are two to four times more likely to have respiratory infections than children in the West. (The increased risk associated with access to adequate sanitation is unexpected).

35. The risk of diarrhea seems to be similar in urban and rural areas, but is lower among children from the most well-off households. The 2001 MICS2 estimated prevalence of diarrhea among under-fives to be 19.5%. Interestingly, the model of the determinants of diarrhea does not show a statistically significant result for urban residence, perhaps indicating that environmental conditions and hygienic practices in urban areas are similar to rural areas. Access to safe water and adequate sanitation do not show significant effects, perhaps suggesting that hygienic practices (which are not measured and included in the model) may be important. Like respiratory infection, children in the highest SES quintile are at reduced risk, but differences are not seen among the lower four quintiles, again pointing to a situation of mass poverty. Risk of diarrhea is 1.28 times higher in the central Provinces compared to the West, but the difference East and West is not statistically significant.

4. Child nutrition

36. The prevalence of child malnutrition in DRC is high, comparable to the average in Sub-Saharan Africa with regard to chronic malnutrition (stunting), but much greater than the average with regard to acute malnutrition (wasting), reflecting economic and social crisis. Table 3 above presents estimates for malnutrition prevalence from the 2001 MICS2. Chronic malnutrition affects 38% of under-five children, which is comparable to the estimated average for Sub-Saharan Africa of around 40%. However, acute malnutrition, reflective of shortfalls in nutritional intake in the immediate term, is 16%, higher than the average of 10% seen in other countries on the continent.⁹ Malnutrition increases the risk of death in young children and in a synergetic combination with illness can be particularly deadly. For survivors of childhood malnutrition its effects are lifelong – they are less physically and intellectually productive and suffer from more chronic illness and disability.

Figure 12. Trends in estimated prevalence of child malnutrition, DRC



Sources are 1995 MICS1 and 2001 MICS2.

⁹ A height-for-age ratio under -2 standard deviations (Z-scores) from the median of a reference population is the indicator for chronic malnutrition (stunting), while a weight-for-height ratio under -2 standard deviations from the reference median and/or presence of oedema is the indicator for acute malnutrition.

37. Trends in chronic malnutrition are complex but overall improvements in the non-war-affected parts of the country have been offset by deterioration in conflict-affected areas.

The first MDG is to eradicate extreme poverty and hunger which translates into a specific target of halving between 1990 and 2015 the proportion of people suffering from hunger. The 1995 MICS1 estimated prevalence of chronic malnutrition among under-5 children to be 45.2% while the 2001 MICS1 estimated 38.2%. This may represent an improvement in the overall average for the country, but it hides widening regional disparities related to the conflict and associated socio-economic disruption. The data indicate that chronic malnutrition decreased somewhat in both urban and rural areas of the western Provinces (Kinshasa, Bas-Congo, and Bandundu), and also decreased in urban areas of the central Provinces (Equateur, Kasai-Oriental, Kasai-Occidental, and Katanga). However, chronic child malnutrition increased substantially in the eastern Provinces (Province-Orientale, Maniema, Nord-Kivu, and Sud-Kivu), in both urban and rural areas. For example, in 1995, prevalence of stunting was substantially higher in rural areas of the western Provinces than in rural areas of the eastern Provinces, but the situation reversed by 2001.

38. Acute malnutrition has increased, indicating greater vulnerability to short-term crises.

In contrast to chronic malnutrition, estimated prevalence of acute malnutrition among under-fives increased from around 12% in 1995 to 16% in 2001. Prevalence of acute malnutrition is considered sensitive to short-term fluctuations in nutritional intake. The increase in prevalence indicates both increased crises affecting household food security and an erosion in their ability to cope. The data show increases in prevalence across the country in both urban and rural areas, indicating that children are increasingly vulnerable to short-term shocks to household economies, related to the conflict in the eastern part of the country, but also evident in the West. Figure 12 draws the trends in estimated prevalence of child malnutrition compared to the MDG targets, showing the contradiction between trends in chronic and acute malnutrition, illustrating how overall averages can mask the complexity of such a large country.¹⁰

Figure 13. Concentration curves for under-five chronic malnutrition (stunting), DRC, 1995 and 2001



Authors' estimates from 1995 MICS1 and 2001 MICS2 data.

39. The nutritional situation in rural areas in 2001 was at crisis levels and also very serious in urban areas. In 2001, chronic malnutrition affected 43% of under-five children in rural areas

¹⁰ The increase in acute malnutrition may also suggest that the measured decrease in chronic malnutrition may be partly attributable to survivor bias. That is, high rates of acute malnutrition cause high mortality and it may be that large numbers of children did not survive to be measured in 2001. This is consistent with the increase in child mortality during the period.

and 29% in urban areas. Acute malnutrition prevalence was 18% in rural areas and 12% in urban areas. (Table 3) All of these prevalence estimates are very high; the rate of acute malnutrition in particular suggests a crisis situation in rural areas (particularly for acute malnutrition) and a serious situation in urban areas.

40. More recent studies in specific locations present a varying picture but show generally high rates of malnutrition. A nutrition study in Kinshasa in 2004 found 8.1% acute malnutrition and 22.4% chronic malnutrition among under-fives. Studies in three locations in Equateur in 2004 found rates of acute malnutrition ranging from 3.5% to 12.7%.¹¹

41. There are large disparities in child malnutrition between the poorest and the most well-off, but smaller differences between most of the population. Prevalence of chronic malnutrition among the poorest quintile is 43%, compared to 19% among the highest quintile. Similarly prevalence of acute malnutrition is 20% among the poorest quintile and (a still high) 8% among children in the highest quintile. However, Figure 10 draws concentration curves which are quite flat, indicating little difference in chronic malnutrition prevalence in the general population – a signal of mass deprivation. The graph also indicates that inequality changed little between 1995 and 2001. The concentration indices for chronic malnutrition in both 1995 and 2001 were –0.10.

Table 11. Random-effects logistic models of the determinants of under-five malnutrition, DRC, 2001

	chronic (n = 11,371)		acute (n = 11,446)	
	odds ratio	p-value	odds ratio	p-value
child's age (months)*	1.06	0.00	0.99	0.00
child's age ²	1.00	0.00	1.00	0.00
1 = male	1.29	0.00	1.20	0.00
household size*	1.00	0.81	1.01	0.16
mother's age (years)*	1.00	0.29	1.01	0.09
1 = mother has education	0.85	0.01	0.73	0.00
1 = urban	0.63	0.00	0.88	0.37
socio-economic quintile**	0.88	0.00	0.91	0.01
cluster proportion BCG vaccination	1.60	0.45	1.32	0.70
Center	1.44	0.00	1.07	0.62
East	1.82	0.00	0.75	0.08
% variation associated with cluster	17%		20%	

* centered at the mean

** incidence rate ratios are associated with an increase from a quintile to the next higher quintile
Authors' estimates from 2001 MICS2 data.

42. Multivariate models confirm that mother's education, urban residence, and higher socio-economic status are associated with lower risk of child malnutrition. Table 11 reports estimates from regression models of the determinants of chronic (stunting) and acute (wasting) malnutrition among under-five children as measured by the 2001 MICS2. The high proportion of variation associated with differences between sample clusters and not explained by variables in the model (16% for stunting and 20% for wasting) indicates that other contextual factors are important (ie. climate, agricultural and economic conditions, and conflict and insecurity). Children whose mother received any education are estimated to be 0.85 times less likely to be

¹¹ The low 3.5% estimate is clearly due to survivor bias in this particular location, since the same survey found extremely high crude mortality rates among under-five children.

stunted and 0.73 times less likely to be wasted. Better educated mothers are more likely to offer better caring and feeding practices for their children and would also be more likely to ensure that their children receive skilled health care. Residents of urban areas are significantly at lower risk of chronic malnutrition (although this is not statistically significant for acute malnutrition). For each increase in SES quintile, the risk of stunting decreases by 0.88 times and the risk of wasting by 0.91 times.

43. Regional patterns are also evident, as the risk of stunting is 1.4 to 1.8 times greater in the central and eastern Provinces than in the West of the country. Unexpectedly, a lower risk of acute malnutrition in the East is marginally statistically-significant.¹²

44. **Rates of exclusive breastfeeding are low and declining in DRC, increasing the vulnerability of infants to malnutrition and disease.** Because breastfeeding significantly reduces infant morbidity and mortality in developing countries, it is recommended that infants be exclusively breastfed for the first 4 to 6 months of their lives. Data from the MICS2 survey show that although 95% of children are breastfed at some point, only 29% of children under two years of age are exclusively breastfed for their first four months and 24% for their first six months.

45. The prevalence of breastfeeding does not appear to be affected by urban/rural residence, socioeconomic group, or the education level of the mother. However, there are some significant regional differences. Exclusive breastfeeding is more common in Equateur, Province-Orientale, Nord-Kivu, and Maniema (45-60% of children under four months), and less common in Bas-Congo, Katanga, and Kasai-Occidental (under 20%), with Kinshasa and Kasai-Oriental in the middle (around 30%).

46. Exclusive breastfeeding appears to be on the decline in DRC. According to the MICS1, in 1995, 34% of the infants were exclusively breastfed for the first four months, compared to 29% in 2001.

5. Reproductive and maternal health

47. **The population of DRC is large, growing fast, and very young.** With an estimated 58.3 million people in 2004, the population of DRC is the third largest in Sub-Saharan Africa (after Nigeria and Ethiopia). Estimated annual population growth is 2.9%. (US Census Bureau, 2004) With its high fertility and mortality, almost half the population (48%) is under 15 years old and only 3.5% is over 60.

48. **Fertility is among the highest in the world, in both urban and rural areas, and is not decreasing.** The total fertility rate (TFR) is very high at 7.1, indicating that women in DRC have on average more than seven children. This is considerably higher than the estimated average of 5.1 in Sub-Saharan Africa and among the highest in the world. It is estimated to be 7.4 in rural areas and a still high 6.3 in urban areas. This is consistent with the level of poverty, lack of access to family planning, and high child mortality in DRC. (Given the child mortality rates discussed previously, of these seven children, one or two can be expected to die before the age of five, providing a motivation to have many children). The estimated annual crude birth rate is 48.5 per 1,000 population, indicating about 2.8 million births annually. There are no indications that fertility is declining – the estimated total fertility rate in 1995 was 7.2. An increasing trend in fertility has been evident since the 1950s, when total fertility was estimated to be around 5.9, rising to 6.3 in the 1980s. (Schneidman, 1990)

¹² This is due to very low measured prevalence in urban areas of the eastern Provinces, which is unexpected and may be a result of error.

49. Adolescent fertility is particularly high. The 2001 MICS2 found that 20% of girls aged 15-19 were mothers. Adolescent motherhood is more common among the poorest (26% in the lowest quintile, compared to 13% in the highest). Although the 2001 MICS2 found that adolescent girls were slightly less likely to be mothers in urban areas (17% compared to 22% in rural areas) a small survey of girls 12-19 in Kinshasa found that 30% had had a sexual experience, and that one third of these had been pregnant. (Casey, 2002)

50. Mothers suffer from a very high risk of mortality which has increased during the 1990s and is apparent all parts of the country. The maternal mortality ratio in DRC is estimated from the 2001 MICS2 data at 1,289 per 100,000 live births. This implies over 36,000 maternal deaths annually. This estimate is derived from indirect methods and refers to the time period about 12 years before the survey – the late 1980s. Given the crisis experienced by the country during the 1990s, current maternal mortality is likely higher. For example, a direct estimate from a survey in 1998 (n = 8,613 households) was 1,837 per 100,000. (Ministère de la Santé, 1999a) Given the range of uncertainty around any particular maternal mortality ratio estimate, what is important is the order of magnitude, and it is clear that the level of maternal mortality in DRC is among the highest in the world. The target for the fifth MDG is to reduce maternal mortality by three-quarters between 1990 and 2015, implying a ratio by 2015 in DRC of around 320 per 100,000 live births. This is certainly unattainable by that time, although significant progress is possible with sufficient effort and investment.

51. A 2001 survey (n = 3,049 households) in Kinshasa estimated a maternal mortality ratio of 1,393 per 100,000 live births using the direct method, which refers to mortality during the previous year. Like with other health outcomes, urban areas and the west of the country would be expected to have lower maternal mortality. However, the level of mortality observed in Kinshasa is still extremely high (even though perhaps lower than elsewhere), indicating that the risk of maternal mortality is elevated across the country. Indirect estimates from this survey indicate that maternal mortality in Kinshasa in the late 1980s and early 1990s was considerably lower, at around 500-600 per 100,000 live births. (OCHA, 2001)

52. It is also important to note that the high fertility significantly increases each individual woman's lifetime risk of maternal death. In addition, the high rate of adolescent fertility increases mortality, as young mothers are at increased risk.

53. Mothers die in childbirth due to lack of access to emergency obstetric care, delays in seeking and obtaining such care, and often poor quality. A health facility survey in Kinshasa in 2001 found that the main immediate causes of maternal death in facilities were hemorrhage (31%), sepsis (10%), eclampsia (9%), and severe malaria (5%). (OCHA, 2001) These conditions are all preventable or treatable if appropriate quality care is received in time. However, in situations such as DRC, delay in deciding to seek care, delay in reaching a facility where care is offered, and delay in receiving appropriate care at the facility, all contribute to a lack of effective care for delivery complications. Unsafe abortion seems to be an important cause of maternal death. A survey in Kinshasa, for example, found that 30% of pregnant adolescent girls had attempted unsafe abortion. (Casey, 2002)

54. A sixth of mothers are malnourished. The 2001 MICS2 measured the body-mass index of non-pregnant mothers, estimating that 17.3% are malnourished. In rural areas 19.2% are malnourished, while in urban areas the proportion is 13.2%. Among the poorest quintile, 21% of mothers are malnourished, compared to 12% among the most well-off. Children of under-nourished women are also significantly more likely to be acutely malnourished (wasted). For example, 21% of the under-five children of mothers considered malnourished were also acutely malnourished, while the proportion for other mothers was (a still high) 12%.

55. Poor maternal health and care lead to poor pregnancy outcomes. A significant proportion of pregnancies end in what can be considered poor outcomes. A study of 10,528 deliveries between 1993 and 2001 in one reference hospital in the Ituri district Province-Orientale found that 15.3% had poor outcomes, including 10.5% premature births, 3.8% stillbirths, and 3.3% abortions. The study also found an increasing trend in these outcomes associated with the conflict. For example, premature deliveries were 6.3% of the total in 1993, but exceeded 11% during peak periods of the conflict. (Mugisho *et al.*, 2003) Similarly, a 2004 retrospective mortality survey in all parts of the country found that around 11% of pregnancies ended in spontaneous abortion or stillbirth. (IRC, 2004)

56. Poor maternal health and inadequate delivery care leads to high neonatal mortality. Good care at delivery is essential to newborn health. Neonatal mortality (under one month of age) in DRC is not known. In other countries of Sub-Saharan Africa it can account for half or more of infant mortality (under one year of age), which is estimated at a very high 128 per 1,000 in DRC. Assuming a neonatal mortality rate of 65 per 1,000 suggests that 200,000 of the 2.8 million newborns annually in DRC will die soon after birth.

57. Over one in ten newborns has low birthweight. Low birthweight is an indicator of poor maternal health and nutrition, and is a determinant of the child's longer-term survival and development. The 2001 MICS2 found that only half of births in the previous year were weighed. Of these, 11% had low birthweight. A similar proportion of all births were considered underweight according to the perception and report of their mothers. This proportion is consistent with estimates from other very poor countries.

58. Many girls and women are victims of sexual violence associated with the conflict, particularly in Eastern DRC. Thousands of women and girls (and some boys and men), particularly in Eastern DRC, were victims of sexual violence committed by members of the different armed groups involved in the conflict. An assessment in Sud-Kivu in 2001 estimated that 2,000 women had experienced sexual violence during recent conflict there. (Casey, 2002) Over a six-month period during the last half of 2003, 550 victims of sexual violence, including some boys and men, were treated at one NGO-supported hospital in Sud-Kivu. (MSF, 2004) Medical consequences include HIV/AIDS transmission and reproductive health problems, particularly fistulae. There are also serious psychological and social effects, particularly ostracism by women's family and community. Along with continuing insecurity in parts of the country, sexual violence continues; for example, in 2004 an NGO documented 130 rapes committed during several weeks of conflict in Bukavu, Sud-Kivu. (IRIN, 2004)

6. HIV/AIDS

59. Adult prevalence of HIV is estimated at 4-5%, which indicates an epidemic which has spread from high-risk groups to the general population. The economic disruption and isolation due to the war may have kept the epidemic from increasing at a faster rate in recent years, although large groups, such as displaced persons, have likely become more vulnerable to the disease. It is estimated that about 1.1 million people are living with the disease, among whom almost 60% are women, and that 100,000 deaths annually are caused by AIDS. An estimated 770,000 children are orphans because of the disease.¹³ (UNAIDS, 2004) Because a nationally-representative prevalence survey has not been done, these estimates are derived from models. Sentinel surveillance among pregnant women attending antenatal care is not complete or systematic. The available data measure prevalence among pregnant women in the range of 4-8%,

¹³ Note that these are UNAIDS estimates for end 2003. UNAIDS estimates adult prevalence at 4.2% while the DRC National HIV/AIDS program estimate is over 5%.

and suggest that prevalence has remained relatively stable in urban areas since 1990 but there are signs of an increasing trend in rural areas. (UNAIDS, 2004)

60. The available information indicates high prevalence among high-risk groups. Studies in Kinshasa through the 1990s have consistently shown HIV prevalence of over 30% among commercial sex workers. Studies in the late 1990s in a hospital in Goma (Nord-Kivu) found that 50-99% of sexually-transmitted infection (STI) patients were infected with HIV. Prevalence among tuberculosis patients in hospitals in Kinshasa, Bwamanda (Equateur), and Mbuji-Mayi (Kasai-Oriental) in 1997 was found to be over 30%. (UNAIDS, 2004)

61. General awareness of HIV/AIDS is high, but more specific knowledge of preventive measures is limited. The 2001 MICS2 found that 92% of adult women knew of HIV/AIDS and that 87% knew of at least one preventive measure. However, only 40% knew of three methods of prevention (faithfulness to a un-infected partner, condom use, and use of sterilized needles). While 80% reported that faithfulness can prevent the disease, only 48% knew that condom use could do so. In addition, only 20% knew that all three erroneous statements given about HIV transmission were false; for example, only 35% knew that the disease cannot be transmitted by mosquitoes. Taken together, only 10% of women both knew of the three preventive methods and knew that the three erroneous statements about transmission were false.

62. Specific knowledge is lower in rural areas and among the poor. Although awareness of the disease is high in both rural and urban areas, specific knowledge is more limited in rural areas. In rural areas, 35% of women knew of the three preventive methods, compared to 50% in urban areas, and 43% knew of condoms as a preventive measure compared to 57% in urban areas. In rural areas, 18% knew that the three erroneous statements were false, compared to 24% in urban areas. Similarly, although general awareness of the disease is almost 90% among the poorest quintile, only 32% know of all three preventive measures, compared to 54% in the highest quintile. With regard to false statements about transmission, 18% in the lowest quintile could identify all three, compared to 25% in the highest quintile.

63. Risky behaviors contribute to HIV transmission, with women in rural areas particularly vulnerable. The 2001 MICS2 found that about 11% of women had a sexual partner other than their regular partner during the previous year, and that only 13% of these used condoms. Almost 50% of those reporting non-regular sexual relations had two or more non-regular partners. In all relationships, condom use is very low – in 2001, only 2.3% of women in partnerships reported using them.

64. In rural areas, non-regular sexual relations are more common (12%) compared to urban areas (9%), use of condoms in these relationships much less frequent, and several partners more common. Socio-economic differences in risky sexual behavior are also evident, as lower quintiles are more likely to have non-regular partners, less likely to use a condom, and more likely to have several partners. These patterns indicate that risky sexual behavior is associated with economic vulnerability (as opposed to being solely an issue of choice or morality).

7. Malaria

65. All of the population of DRC is vulnerable to malaria, which is the single most important cause of morbidity in the country. It is estimated that 97% of the population is at risk of endemic malaria, while the remaining 3% - mostly living in highlands in the east of the country – are vulnerable to epidemic malaria. As discussed above, the 2001 MICS2 showed that 42% of under-five children had fever in the previous two weeks, and that this varied little geographically or by socio-economic status. This level of prevalence is consistent with 6 to 10 episodes of malaria experienced by under-five children annually – for an implied total of 60-100

million cases. Not surprisingly, malaria is estimated to account for at least one third of outpatient consultations at health facilities.

66. Malaria is the number one killer of under-five children in DRC and a significant cause of mortality among older children and adults. Recent retrospective mortality surveys show that fever is associated with 40% of deaths of under-five children in all parts of the country. Assuming that 80% of these fevers are due to malaria implies over 180,000 annual deaths of under-five children caused by the disease. The data also indicate that fever is also the most common reported cause of death for older children and adults – around 20%. (IRC, 2004)

67. Malaria is an important contributor to poor maternal health and nutrition, directly and indirectly contributing to maternal mortality. The data from one hospital discussed above indicated that 5% of maternal deaths could be directly attributed to malaria. In addition, having malaria during pregnancy can result in a variety of adverse outcomes such as spontaneous abortion, low birthweight, and neonatal death.

8. Tuberculosis and others

68. Tuberculosis (TB) incidence is high, seems to be increasing, causes a significant proportion of mortality, and is associated with HIV infection. The National Tuberculosis Control Program estimates annual TB incidence in DRC at 384 per 100,000 population. Incidence may be increasing, as the number of notified cases has increased steadily since the early 1990s. It is thought that 25-30% of TB cases are also infected with HIV. (WHO, 2004) Data from recent retrospective mortality surveys suggest that 10-20% of mortality among older children and adults is associated with TB. A recent study in Kinshasa found that 5.4% of new and previously-treated cases were multi-drug resistant. Country-wide, resistance is estimated at 1.5% of cases. Social stigma adds to the burden of those suffering from the disease and hampers control efforts.

69. **A number of other infectious diseases are endemic and epidemic.** Along with the infectious diseases which cause most morbidity and mortality among children (malaria, measles, respiratory infections, and diarrhea) a number of other diseases are endemic among some populations or erupt in periodic epidemics. These include meningitis, trypanosomiasis, onchocerciasis, leprosy, schistosomiasis, plague, ebola virus, and others.

9. Overall mortality

70. An estimated 3.8 million “excess” deaths have been associated with the conflict in DRC since 1998. Any description of the health situation in DRC requires a discussion of overall mortality, particularly related to the conflict. The NGO retrospective mortality surveys discussed above in relation to under-five mortality were primarily concerned with estimating crude mortality rates for all ages. In 1998-2001, a series of retrospective mortality surveys were done by IRC in Eastern DRC. Crude mortality rates (all ages) of between 2.7 and 12.1 per 1,000 per month were estimated from households’ reports of members dying during a recall period. In terms of daily rates, these were equivalent to 0.9 to 4.0 per 10,000 per day. Observed crude mortality is often presented this way in order to allow comparison with a threshold of 1 death per 10,000 per day, accepted as the signal for a humanitarian emergency.

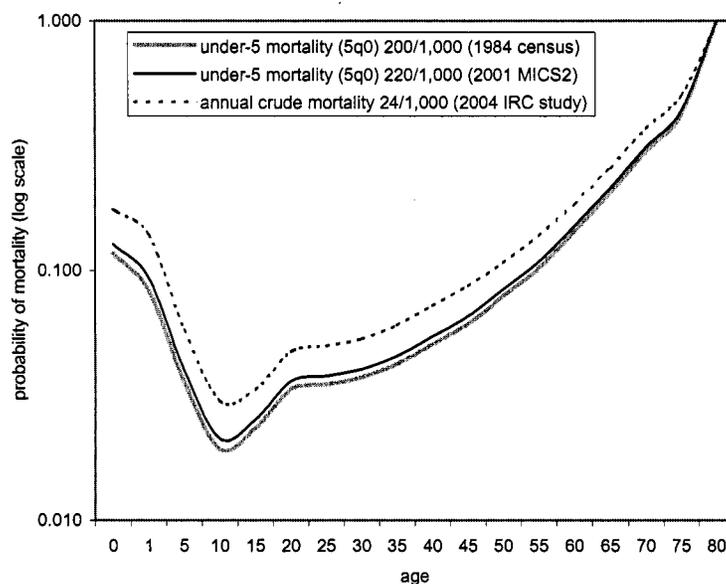
71. In 2001, MSF studied mortality in five locations across the country, finding crude mortality rates of 0.6 to 2.7 per 10,000 per day. In 2002, IRC conducted a set of surveys which were more representative than previous exercises, covering areas in both east and west and contacting 4,500 households in 20 Health Zones. In the eastern half of the country, monthly crude mortality was estimated at 3.5 per 1,000, while in the West it was estimated at 2.0 per 1,000, for an overall

average of 2.2 (equivalent to 1.2 per 10,000 per day in the East and 0.7 per 10,000 per day in the West). IRC conducted a similar and expanded set of retrospective mortality surveys in 2004, questioning 19,500 households in 25 Health Zones. From this, it was estimated that crude mortality was 2.3 per 1,000 per month in the eastern half of the country, 1.7 in the West, and 2.0 overall (equivalent to 0.7 per 10,000 per day).

72. The various IRC studies compared their mortality estimates to an assumed baseline for Sub-Saharan Africa of 1.5 deaths per 1,000 per month in order to estimate “excess” mortality due to the war. By the time of the 2004 study, this estimate had reached 3.8 million.

73. Life expectancy is low, at an estimated 45 years or under, and has been decreasing. Estimates of life expectancy are derived from models and can vary depending on the baseline data and assumptions. The most recent census in DRC was in 1984 but demographers are still dependent on it to make projections, particularly on overall population size. The 1995 MICS1 and 2001 MICS2 provide more recent data on some parameters, in particular age and sex distributions, fertility, and child mortality. However, overall mortality was not measured by these surveys, so that estimates for life expectancy at birth can vary significantly. For example, the US Census Bureau estimates that life expectancy in DRC was 48.3 years in 2000, the World Bank indicates that it was 45 years in 2004, and the UN Population Division estimates that it will be 43.8 years during the period 2005-10.

Figure 14. “North” family model life tables implied by under-five and crude mortality rate estimates from different sources, DRC, 1984-2004



Authors' estimates using US Census Bureau (2003) and data from Schneidman (1990), 2001 MICS2, and IRC (2004).

74. The estimates for under-five mortality from the 2001 MICS2 data, discussed above, were derived using an indirect method which makes use of model life tables (representations of the mortality of all ages in a model population). These tables can be used to characterize the overall population mortality pattern implied by observed mortality among one or more age groups, such as estimated under-five mortality rates.¹⁴ (Figure 14) Using this method, the under-five mortality estimate from the 2001 MICS2 data of 220 per 1,000 implies life expectancy at birth of 47.6 years.

¹⁴ The “North” family of the Coale-Demeny model life tables is used.

75. The 2004 IRC retrospective mortality survey provides mortality estimates derived in a different manner; that is, direct estimation from reported numbers of deaths during a 16-month recall period. The survey estimated crude mortality among the entire population –2.0 deaths per 1,000 per month. Linking this to an implied life expectancy on a model life table results in a considerably lower figure of 39.2 years.¹⁵ Insofar as this set of retrospective mortality surveys was valid – and there is no obvious reason to question this – this estimate is the more likely because it comes from data on the mortality experience of the entire population. If this is the case, it would further indicate that the mortality experienced by the population of DRC in recent years has been truly catastrophic.

76. One basis for comparison may be estimated life expectancy in 1984 (47.2 years) and 1990 (52 years). Even the higher range of current estimates would mean that decades of progress have been erased.

77. The increased mortality associated with the conflict was not due to direct violence, but due to deterioration of socio-economic, nutrition, and health conditions. Data on the causes associated with reported deaths from the 2004 retrospective mortality survey make clear that most mortality is due to increased malnutrition and disease caused by displacement and socio-economic disruption associated with the conflict. Cause-specific mortality among under-fives is detailed above in Figure 11. Among older children and adults, about a third of deaths had unknown or unreported causes. The main reported causes of death were fever (around 20% of the total which includes the unknown/unreported category), diarrhea (8-12%), tuberculosis (7-12%). Respiratory infection and malnutrition were reported to each cause around 5-10% of deaths. Measles, meningitis, and accidents were reported to be associated with around 4-5% of mortality. HIV/AIDS was reported in about 1.5% of cases, and maternal mortality was reported to account for 2.5-4.0%. Violence was one of the least common reported causes, although much higher in the eastern part of the country (around 3%) than in the West (less than 0.5%).

¹⁵ Like other life expectancy estimates, this is the expected years of life for a birth cohort if it were to experience the mortality conditions measured for a particular period – in this case, the survey recall period from January 2003 to April 2004.

Chapter 2: Health Service Utilization

1. Overall service utilization

1. Utilization indicators are analyzed as reflections of the performance of the health system, but depend on a range of factors. Because the effectiveness of the health system can only be felt through the use of its services, health service utilization indicators are analyzed as reflections of health system performance. Utilization is affected by a range of factors, both inside and outside the health system. Supply-side factors, relating to policy and programs, organization, human resources, drug supply, and service quality, are discussed in Chapter 3. In this chapter, levels, trends, and disparities in health service utilization are described as reflections of patterns in performance of the system, recognizing that a number of demand-side factors, in particular household education and socio-economic status, are important.

Table 12. Annual rate of new curative consultations per capita, 2001

province	average rate	range	% population covered by reports
Bandundu	0.16	0.00-0.25	65%
Bas-Congo	0.07	0.01-0.21	72%
Equateur	0.40	0.04-0.78	19%
Kasai-Occidental	0.06	0.02-0.36	87%
Kasai-Oriental	0.09	0.03-0.62	60%
Katanga	0.16	0.02-0.64	64%
Kinshasa	0.15	0.05-0.45	100%
Maniema	..	..	0%
Nord-Kivu	0.42	0.05-1.99	100%
Province-Orientale	..	..	0%
Sud-Kivu	..	..	0%
overall estimate	0.15	0.00-1.99	54%

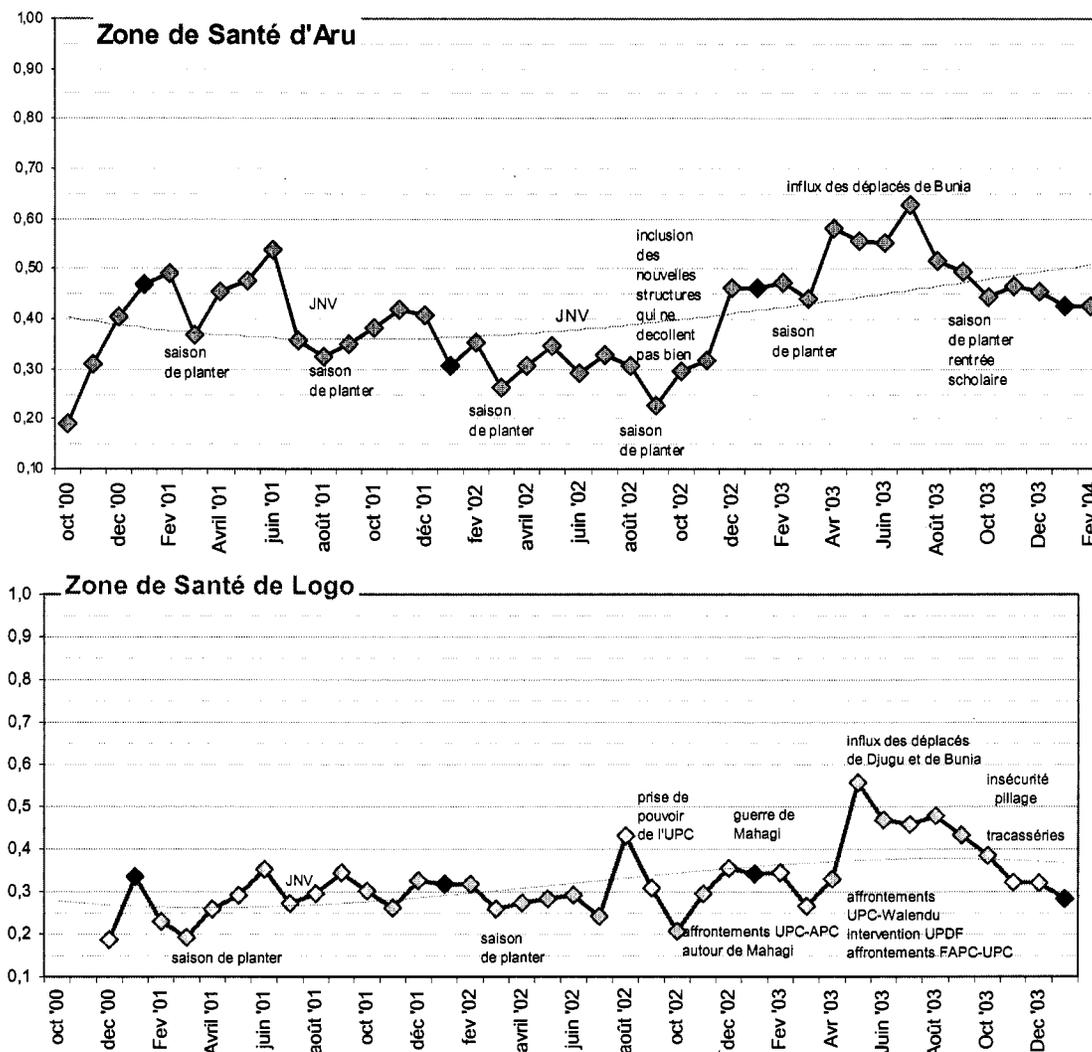
Source is Service National des Informations Sanitaires (SNIS) (2003).

2. Health information system indicators show overall service utilization is very low, both in comparison to need and in comparison to past decades. In addition to indicators derived from household surveys, health information systems can provide measures of service utilization. An indicator used widely in DRC is the ratio of new consultations for curative care to catchment area population. This is often measured on the scale of the Health Zone and can vary widely. Small-scale surveys and NGO reports suggest that deterioration of health services over the past decades has led to very low utilization in the absence of external assistance – in the range of 0.10 to 0.20 curative consultations per capita. Table 12 provides 2001 data on this rate from the national health information system.¹⁶ With Health Zones covering about 54% of the population reporting, the average rate of new curative consultations per capita was 0.15. By comparison, rates of 0.60 were observed in the country during the 1980s. The rate of 0.60 is also a goal for current humanitarian programs, while an often-cited ideal target for health services in DRC is 1.0. However, the real need for health services in this malaria-endemic country is more likely at least 2.0 consultations per capita annually.

¹⁶ Reported estimates do not reflect utilization of private for-profit services, which may be important in particular in Kinshasa. Data from private non-profit (confessional) providers in rural areas are more likely to have been collected by the health information system, but this is not clear from the documentation.

3. **There is wide variation in utilization, with higher levels of utilization concentrated in a limited number of facilities in a minority of Health Zones.** Table 12 shows that, except for Equateur and Nord-Kivu, province average curative service consultation rates are fairly similar, in the range of 0.06-0.16 per capita. Reporting is very incomplete in Equateur, so that the real figure is likely in this low range. However, within provinces, there is wide variation, with many Health Zones reporting curative consultation rates of less than 0.10, and only a few with utilization rates anywhere close to 1.0. This suggests a situation in 2001 where adequately functioning public health services were concentrated in limited number of facilities in a minority of Health Zones.

Figure 15. Annual per capita rate of curative consultations in two Health Zones in Province Orientale supported by the EU, 2000-2004



Source is Maltheser (2004).

4. **External support to Health Zones, improving service quality and reducing user fees, can raise utilization rates.** The 2001 utilization rate of 0.42 shown in Table 12 for Nord-Kivu, where all Health Zones reported, is somewhat higher than what is observed elsewhere, perhaps reflecting patterns of external assistance at this time. At the Health Zone and facility levels, NGO reports indicate that external assistance can indeed increase utilization. For example, the NGO

COOPI reports that the curative consultation rate in two Health Zones it supported under a humanitarian program in Equateur increased from 0.18 in mid-2000 to 0.65 by end-2002. The NGO ECC/IMA reports that under a World Bank-supported project, average utilization rates in a number of Health Zones increased within a year from 0.06 to 0.21 in Kasai-Occidental and from 0.10 to 0.27 in Katanga.

5. External support is not the only factor affecting utilization as services are affected by a variety of contextual forces. A variety of factors can be at work preventing significant improvement, from the scale and quality of the external assistance itself, to contextual forces such as economic and seasonal events and political instability and conflict.

6. Figure 15 provides interesting illustrations of some of the factors which affect health system performance and utilization. The graphs show the evolution in the annual rate of curative consultations per capita in two Health Zones in Province-Orientale supported by the European Union through the NGO Malteser between 2000 and 2003. In both Zones, baseline utilization rates were under 0.20. Factors related to the health system itself are associated with changes in utilization. In Aru, the start of assistance in 2000 is associated with increases in utilization, followed by ups and downs, but a general increasing trend to rates of around 0.40-0.50 by the end of 2003. In Logo, an initial increase after the start of assistance is followed by stagnation, so that by the end of 2003, the rate was around 0.30. Short-term variation is associated with discrete events, but the overall trend in Logo is explained by the fact that a number of private non-profit providers are present and extensively used by the population. This illustrates a number of issues: i) the important role of the private non-profit sector; ii) the need for assistance programs to take in account private providers; and iii) the weakness of health information statistics which do not include data from private services. Other health system factors are at work. In Aru, inclusion of additional facilities “which did not take off well” in the assistance program is associated with a decrease in utilization. National Immunization Days (JNV) are associated with decreases in utilization, perhaps due to diversion of health staff.

7. Seasonal factors, in particular the planting season, are also correlated with decreases in utilization. Conflict and displacement are also important. In Logo drops in utilization are correlated with fighting in 2002, while general insecurity in 2003 is associated with a declining trend in utilization. In both Zones, utilization jumps with influxes of displaced persons.

8. Data from Rutshuru in Nord-Kivu also illustrate how contextual factors can affect health services, at the same time as showing that Health Zones can be quite resilient in situations of crisis. Porignon *et al.* (1998) found that the annual per capita rate of curative consultations increased from 0.10 in 1985 to 0.39 in 1995, despite drastic cuts in government and external funding at the start of the 1990s. An influx of Rwandan refugees in 1994 dramatically increased the demand, which the Health Zone was largely able to meet with some external assistance. The authors conclude that the resilience of the health system in these circumstances can be attributed to the zonal organization of services, integrating primary and first-referral services, decentralization of decision-making to the zonal level, the long-term development of health human resources in the zone, and the limited but steady external support.

2. Hospital service utilization

9. Hospital inpatient admission rates are very low. In line with overall service utilization rates, inpatient admissions to first-referral hospital services are very low, estimated in many areas to be around 10-15 new admissions per 1,000 population. This can compare to rates around 35 observed in the country during the 1980s and an average rate of 45 observed in several Sub-Saharan African countries during the same period. Table 13 provides 2001 health information system estimates, averaging around 15 inpatients per 1,000 population. A 2005 study of data

from 78 hospitals found similar rates, with on average 18.9 hospital admissions per 1,000 population. (Révillion, 2005)

Table 13. Annual rates of hospital inpatients per 1,000 population and hospital bed occupancy, 2001

province	inpatients per 1,000 population	bed occupancy rate	% population covered by reports
Bandundu	21	49%	58%
Bas-Congo	12	10%	85%
Equateur	15	47%	29%
Kasai-Occidental	..	..	0%
Kasai-Oriental	14	60%	53%
Katanga	10	16%	56%
Kinshasa	..	..	0%
Maniema	..	..	0%
Nord-Kivu	17	38%	90%
Province-Oriental	..	..	0%
Sud-Kivu	..	..	0%
overall estimate	15	37%	37%

Source is Systeme National des Informations Sanitaires (SNIS) (2003).

10. Bed occupancy rates are similarly low, reflecting both low utilization and a legacy of poorly-functional infrastructure. The overall average bed occupancy rate in 2001 from reported data is 37% (Table 13). In provinces with relatively high reporting completeness, the rate is 10% in Bas-Congo and 38% in Nord-Kivu. The 2005 study of 78 hospitals found an average bed-occupancy rate of 37.7%. (Révillion, 2005) These figures suggest a situation of low utilization combined with a legacy of infrastructure which is no longer functional after years of deterioration.

3. Child health and nutrition service utilization

11. Indicators from household survey data similarly show low utilization of basic child health and nutrition services. Indicators of service utilization measured by household surveys do not have some of the limitations of health information system data, in particular relating to reporting completeness and uncertainties about the denominator. Some of the health-related MDG indicators described in Table 3 in Chapter 1 are such measures. Table 14 provides estimates from the 2001 MICS of a number of indicators relating to child health services.

12. Coverage of routine immunization and other basic preventive child health services is low, especially in rural areas. Coverage of basic preventive services is low, particularly in rural areas, where less than half of one-year old children had measles or BCG vaccination. Coverage of at least one polio vaccination is better, at over 70% in both urban and rural areas. These patterns suggest that while polio vaccination campaigns may be achieving some success, routine immunization in rural areas is performing very poorly. A survey of five provinces (n = 613) found measles vaccination coverage of 70.9%. (ESP, 2003) A small survey in Nord-Kivu in 2003 (n = 292) found that 53% were fully vaccinated. Of the 22% who had no vaccinations, reported reasons were mostly related to supply factors – lack of vaccines and services at the health centers. (Soeters, 2003) Problems experienced on the ground by an NGO operating in Province-Oriental include poorly trained and motivated personnel (since they cannot charge fees for vaccinations, but do not receive adequate salaries), problems with the cold chain, and unreliable vaccine supply. (Maltheser, 2004)

13. Coverage of regular vitamin A supplementation is low. The 2001 MICS found that coverage of Vitamin A supplementation is low, with 11.5% of one-year children having received it during the previous six months. However, although not administered as often as recommended, this intervention seems to be somewhat available in that an additional 51.6% of children were reported to have received supplementation at some point. A survey in five provinces (n = 880) found a lower rate of 22.5% who had received vitamin A supplementation at some point. (ESP, 2003)

Table 14. Child health service utilization indicators, DRC, 2001 (%)

	urban	rural	overall
primary preventive			
polio-1 vaccination (12-23 mos)	79.4	69.0	72.4
measles vaccination (12-23 mos)	67.2	36.5	46.4
BCG vaccination (12-23 mos)	73.6	43.3	53.1
vitamin A supplementation (6-59 mos)*	13.7	10.4	11.5
insecticide-treated bednet (under 5)	2.1	0.1	0.7
primary curative			
ARI treatment by health provider (under-5)**	46.3	32.3	35.8
treatment with anti-malarials (under-5)**	63.0	47.4	52.0

* in previous 6 months

** children with ARI or fever in previous 2 weeks

Source is 2001 MICS2.

14. A service package designed to provide basic child health and nutrition interventions seems to be available to an extent, but regular utilization is low. The main strategy for providing basic preventive child health and nutrition services, particularly immunization, vitamin A supplementation, and growth monitoring, is through “consultations pré-scolaires” at primary health care facilities. The 2001 MICS measured several indicators for utilization of these services. In urban areas, 64.7% of under-five children are reported to have a growth chart, compared to 42.9% in rural areas. The overall average is 50.0%. This indicates fairly high coverage in urban areas in particular, but there is evidence that these services are used infrequently, particularly as the child gets older and vaccinations are no longer provided. The survey found that only 28.2% of under-five children in urban areas and 21.9% in rural areas had been weighed during the previous three months. The overall average is 24.0%.

15. Continuity of child health services is poor. Vaccination coverage data can provide indicators for continuity of services. Three doses of DTP are necessary for effective protection and the 2001 MICS found that overall coverage of DTP1 among one-year-olds was 51.2%, but this declined to 29.9% for DTP3. This means that 41% of the children who received the first dose did not continue on to the third dose. In urban areas, this proportion was 32%, while in rural areas it was 50%.

16. Use of insecticide-treated bednets is extremely uncommon, related to lack of awareness, availability, and cost. The 2001 MICS indicates that only 0.7% of under-5 children were sleeping under one. In fact, utilization of any bednet (treated or untreated) is low, at 11.8%. This low utilization is likely related to both awareness and cost. A study in Nord-Kivu found that only 39% of respondents had even heard of bednets, and only 5.6% of households use one (n = 352). The average price of a bednet was found to be over \$US6, and 49% of respondents indicated they do not use a net because of the cost. (Soeters, 2003) In Kasai-Oriental, a survey (n = 470)

found that only 12% of households used a bednet. Of those not using bednets, 47% reported it was due to financial reasons and 24% reported it was due to lack of availability. (PSF, 2003)

17. The evidence on household child health knowledge and behavior indicates considerable requirements for health education. The 2001 MICS assessed caregivers' knowledge of signs which should spur them to seek care for their child: not able to drink or breastfeed (21.7%), becomes sicker (32%), develops a fever (47.5%), has fast or difficult breathing (22.8%), has blood in stools (18.9%), or is drinking poorly (13.5%). A survey in five provinces (n = 4,658) found that 72% of caregivers recognized high fever as a sign that treatment should be sought, 43% would seek treatment if the child seems to be suffering or does not play, and 29% indicated that a child not eating or drinking would be cause for concern. (ESP, 2003) These figures indicate substantial gaps in knowledge of child health danger signs.

18. Indicators also suggest that utilization of basic curative child health interventions is low. The 2001 survey found that less than a third of under-5 children with ARI symptoms were treated by a health service provider in rural areas, and less than half in urban areas, with an overall average of 35.8%. (Table 14) Although treatment with anti-malarials for febrile children in urban areas is higher, at around two-thirds, it is less than 50% in rural areas, with an overall average of 52.0%.

19. Only a minority of febrile children receive treatment. The 2001 MICS2 found that 31% of children suffering from fever were brought to a clinic and only 53% of these received treatment.

20. Data on home treatment of diarrhea reflects lack of knowledge. The 2001 MICS found that only around 10% in both urban and rural areas reported increasing fluids and continuing feeding for a child with diarrhea in the previous two weeks. A 2003 survey in five provinces found that 25.5% of children with diarrhea in the previous two weeks were not treated in any particular way, while 58.4% received anti-diarrheal, antibiotic, or other types of drugs – which are inappropriate in most cases. Only 23.8% were treated with a packet of oral rehydration salts (ORS) or homemade solution. (ESP, 2003) This survey also found that of children who were ill in the previous two weeks (n = 1,955), 22.2% were given less breastmilk than usual, 26.3% received less liquids than usual, and 52.2% consumed less solid food than usual. (ESP, 2003)

4. Reproductive, maternal, and neonatal health service utilization

21. *Although higher in urban areas, utilization of modern contraceptives is not sufficient to meet demand.* Modern contraceptive prevalence of 9.0% in urban areas is higher than observed in other very poor Sub-Saharan African countries, but still is unlikely to meet demand. The rate of 2.5% in rural areas is very low. (Table 15) A qualitative study in Nord-Kivu and Maniema in 2002 found that family planning services are not offered in an effective way through health services, partially because men, who often have the decision-making authority in the family, are not targeted. (Casey, 2002) There is evidence that the unmet demand is considerable; for example, an NGO assessment in two Health Zones in Maniema in 2002 found that of 600 women interviewed, two-thirds were interested in using modern contraceptives, but none were available to them. (Traore and Grant, 2002) A study in Nord-Kivu in 2003 found that 58% of 462 surveyed women would like to use a family planning method, but only 3% were using a modern method of contraception. (Soeters, 2003) A small survey in Kasai-Oriental (n = 508) found that 58% of women use a traditional method of contraception, while only 13% use a modern method. (PSF, 2003) A survey in five provinces (n = 5,519) found that 8.6% of women were using a modern method, compared to 55.5% using a traditional method. Among the 45.9% not using a method, around half said the reason is that they do not know of any. (ESP, 2003)

22. Antenatal care coverage fairly high in urban areas, but overall only half or pregnant women receive care. The 2001 MICS found that 58.9% of women in urban areas with a birth in the previous year received antenatal care from a qualified person. In rural areas, utilization is lower, at 40.6%. The overall average is 46.1%. Following standard practice, these figures do not include traditional birth attendants, trained or untrained.¹⁷

Table 15. Reproductive and maternal health service indicators, DRC, 2001 (% women 15-49)

	urban	rural	overall
modern contraceptive prevalence*	9.0	2.5	4.4
antenatal care from medical provider**	58.9	40.6	46.1
delivery care by medical provider **	32.0	20.2	23.7

* women married or in union

** women with a birth in the previous year

Source is 2001 MICS.

23. Three quarters of mothers do not receive delivery care by medical personnel. The 2001 MICS shows 32.0% of deliveries in urban areas are attended by qualified personnel, the proportion in rural areas is 20.2%, and the overall average is 23.7%. Table 16 provides 2001 MICS data on the distribution of delivery care by type of provider, showing that traditional birth attendants are the most common caregiver in both urban and rural areas. These findings suggest that efforts to train village midwives have shown some success in DRC.

Table 16. Delivery attendant (% of births in previous year), DRC, 2001

	urban	rural	overall
doctor	7.5	1.7	3.4
nurse/midwife	26.2	19.2	21.3
trained traditional birth attendant	59.1	34.5	41.9
traditional birth attendant	6.6	28.0	21.6
relative/friend	6.4	16.1	13.2
other	1.9	3.5	3.0
no assistance	4.6	7.2	6.4

Source is 2001 MICS.

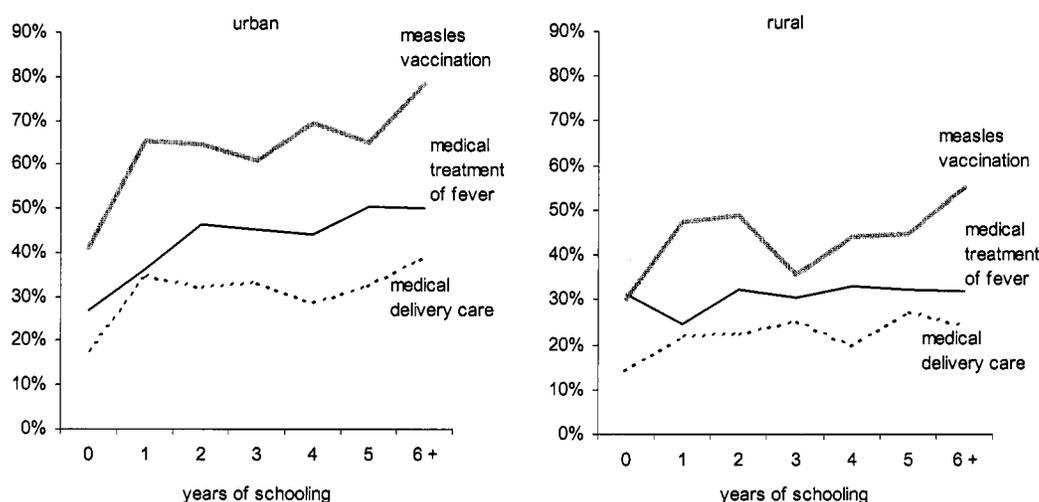
24. A range of factors may be working to limit utilization of medical delivery care in rural areas, including cultural barriers and financial and opportunity costs. For example, an NGO working in Province-Orientale has found that, compared to public providers whose attitudes may be less than welcoming, many women prefer private and traditional delivery attendants with whom they feel more comfortable. Private and traditional attendants also accept more flexible payment terms. Women are also reluctant to leave their homes because they need to ensure the care of other children and also feel they need to buy clothing for themselves and for the newborn if they delivery in a health facility. (Maltheser, 2004) These factors certainly vary by region. For example a small study in Nord-Kivu found that women prefer to deliver with a trained attendant rather than traditional providers, who have a poor reputation for quality. Of 148 deliveries, 81% were at a health facility and only 19% at home with a relative or traditional birth attendant. (Soeters, 2003)

25. The limited information on emergency obstetric care (EOC), one of the main determinants of maternal mortality, suggests that services are available at referral hospitals

¹⁷ Estimates provided by the survey report are higher because this category is included. Estimates of skilled delivery care differ for the same reason.

but quality is an issue, and there are significant financial and geographical barriers to access. A study of hospital data from Rutshuru Zone in Kivu-Nord for the period 1985-95 found a consistent and large difference between the number of Caesarean sections for patients living under 5 km from the hospital compared to those living over 5 km away. (Porignon *et al.*, 1998) A retrospective cohort study of 1,162 women admitted to two rural referral hospitals in Nord-Kivu in 1995-96 found that women who lived 90 minutes walk or more from the hospital had greater risks of obstetric complications and neonatal mortality. The authors estimated that, considering the expected number of complicated births in the catchment area population, less than 3% of potential cases arrived at the hospitals. (Mugisho *et al.*, 2003)

Figure 16. Utilization indicators by mother's education level, DRC, 2001



Authors' estimates with data from 2001 MICS2.

Table 17. Treatment of child with ARI symptoms, DRC, 2001 (% of under-5 children with ARI symptoms in previous 2 weeks)

	urban			rural		
	lowest quintile	highest quintile	overall	lowest quintile	highest quintile	overall
hospital	7	25	15	4	3	2
PHC facility	56	43	40	31	37	32
mobile clinic	0	13	0	0	0	0
CHW	0	0	0	0	0	0
company clinic	0	0	0	0	0	0
private doctor	6	0	3	3	6	6
pharmacy/drug seller	27	0	13	6	14	13
relative/friend/other	26	0	13	19	4	13
none	39	19	41	45	48	45

Source is 2001 MICS2.

26. Along with lack of accessibility related to distance, financial barriers are often high. The cost of a Caesarean section can range from US\$20 to over US\$100 in a country with estimated per capita annual income of under US\$100. There are anecdotal reports of the practice of health facilities detaining women until their families come up with the fees for the procedure. Criel, Van der Stuyft, and Van Lerberghe (1999) provide empirical evidence on the effects of both distance and cost, examining data on insurance coverage and the distance of village of origin for

322 Caesarean sections at Bwamanda hospital in Equateur Province. They found that those not covered by a community insurance scheme were both less likely to have the procedure and more likely to be affected by distance.

27. A study in Nord-Kivu indicates other kinds of issues related maternal care and financing. There, it was found that 7.5% of medically-assisted deliveries involved Caesarean sections and that 39% of deliveries in hospitals were Caesareans. The authors suggest that these rates, high compared to other parts of the country, are related to the financial incentives for health providers. (Soeters, 2003)

5. Utilization by type of provider

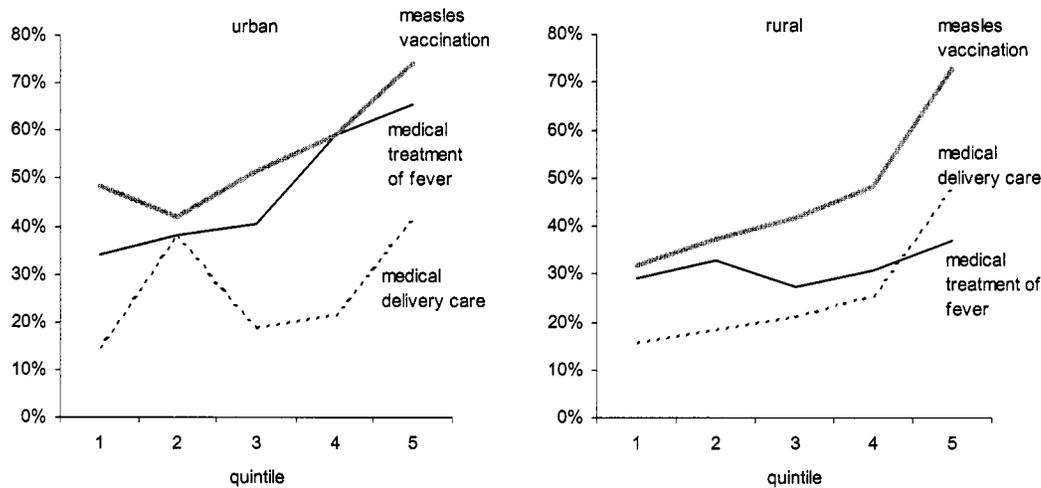
28. The 2001 MICS2 collected data on the treatment of children with ARI symptoms in the two weeks previous to the survey (n = 1,025). Table 17 provides estimates for urban and rural areas, comparing the lowest quintile with the highest quintile of an index of socio-economic status. A number of patterns are evident:

- *In both urban and rural areas, over two thirds of cases either do not receive care or turn to drug sellers or friends/family.*
- *In both urban and rural areas, over 40% of cases do not receive treatment.* In urban areas, the poor are much less likely to receive treatment, while in rural areas, socio-economic differences are not as apparent.
- *An additional one-quarter of cases self-treat.* Together, private pharmacies and drug sellers, and treatment by family, friends, or others (both implying unsupervised or self-medication), account for a total of 26% of cases in both urban and rural areas. In urban areas, the poor are clearly more likely to turn to these types of providers. In rural areas, the better-off are more likely to turn to drug sellers, while the poor are more likely to go to family, friends, or others.
- *Among those who receive treatment from a formal provider, PHC facilities (both public and confessional) are the most commonly used type of provider.* This is the case in both urban and rural areas, accounting for 40% and 32% of cases respectively. In urban areas, the poorest are more likely to attend a PHC facility, while in rural areas the better-off may be more likely.
- *Non-facility types of PHC providers, particularly community health workers (CHWs), are not used at all,* indicating that they are not available for this type of curative care.
- *Hospitals are more likely to be used for this kind of primary care in urban areas (15% of cases), especially by the better-off.* In rural areas, hospitals are rarely utilized for this type of treatment, accounting for 2% of cases).
- *Even in urban areas, few go to private doctors* (3% of cases in urban areas and 6% in rural areas). In urban areas, these tend to be the poorest, while in rural areas, they tend to be the better-off.

29. These patterns are seen in smaller-scale studies, which in addition indicate: i) that traditional healers represent a small proportion of utilization; and ii) utilization of private pharmacies as opposed to PHC facilities seems to vary geographically. A survey in Kasai-Oriental (n = 853) found that among those ill in the previous 30 days, 50% went to a health center, 17% went to a private pharmacy or drug seller, around 4% went to a traditional healer, and 17% received no treatment. (PSF, 2003) A study in five provinces (n = 4,050) found that among household members ill in the previous 15 days, 30% turned to public or confessional health facilities, 40% relied on self-medication, 9% went to traditional healers, and 21% received no treatment. (ESP,

2003) A study in Kivu-Nord (n = 501) similarly found that a total of 33% of illness cases went to a public or confessionnal health facility, 38% turned to a private pharmacy or drug seller, 11% went to a for-profit private health provider, 2% went to a traditional healer, and 15% received no treatment. The study found that the poor were more likely to not receive treatment and to go to a public or confessionnal facility, while the better-off were more likely to go to a private for-profit pharmacy or health provider. (Soeters, 2003)

Figure 17. Utilization indicators by socio-economic status quintile, urban and rural, DRC, 2001



Authors' estimates with data from 2001 MICS2.

6. Determinants of utilization

30. Utilization of health services can be affected by a range of supply and demand factors. Many of the supply-side factors, such as availability, quality, and price of services are discussed in other chapters. Demand-side factors, such as household socio-economic status and education, are also important. Regression analysis can help assess the influence of some of these different factors. Using data from the 2001 MICS2, models of the determinants of important utilization indicators are presented in Table 18 and Table 19. (Statistically significant results of $p < 0.10$ are in bold).

31. **Direct information on health service availability is not available to be included in the models, but there are indications that it is an important factor determining utilization.** The statistical method applied takes in account the variation (random effects) between sample clusters which is not associated with the variables in the model. This proportion is large, between 20 and 40% of the total variation depending on the model. This indicates that contextual factors – for example, availability and accessibility of health services – are very important to utilization.

32. **Education significantly increases health service utilization, especially in urban areas.** Figure 16 shows the unadjusted relationships between indicators of utilization and education level. It shows that in urban areas, measles immunization, medical treatment of febrile children, and delivery care by medical personnel increase with education. It seems that just one year of education has an important effect, with the slopes less steep over higher levels of education. In rural areas, differences in utilization by education level are less evident, although utilization among those with no education at all tends to be lower. The overall lack of differentiation may indicate that poor service accessibility in rural areas affects most groups, educated or not educated.

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33. The multivariate models described in Table 18 and Table 19 suggest further than mother's education is important with regard to immunization and delivery care but effects are not evident for basic curative child health services. A mother who has any education (after controlling for socio-economic status) has 2.0 times the odds that her child is vaccinated against measles and 1.6 times the odds of having qualified assistance at delivery. However, mother's education is not a statistically significant factor with regard to medical treatment of child fever or respiratory infection.

Table 18. Logistic regression models of the determinants of preventive service utilization, DRC, 2001

	measles vaccination (n=2,224)		medical delivery care (n=2,614)	
	odds ratio	p-value	odds ratio	p-value
age (months)*	0.56	0.00	..	..
age ²	0.97	0.00	..	..
1=male	1.03	0.78	..	..
household size*	1.02	0.34	0.97	0.05
mother's age (years)*	1.00	0.18	1.00	0.95
1=mother has some education	1.99	0.00	1.62	0.00
socio-economic quintile	1.37	0.00	1.30	0.00
1=urban	3.13	0.00	1.47	0.12
Center	0.38	0.00	1.00	1.00
East	0.49	0.02	1.23	0.45
% variation associated with cluster	41%		34%	

* centered at the mean

** odds ratios are associated with an increase from a quintile to the next higher quintile

Reference region is West.

Estimation of significance accounts for survey design.

Authors' estimates with data from 2001 MICS2.

Table 19. Logistic regression models of the determinants of curative service utilization, DRC, 2001

	medical treatment of fever (n=4,143)		medical treatment of respiratory infection (n=1,025)	
	odds ratio	p-value	odds ratio	p-value
age (months)*	0.99	0.00	0.99	0.06
age ²	1.00	0.13	1.00	0.79
1=male	1.09	0.24	0.94	0.66
household size*	1.00	0.76	0.98	0.45
mother's age (years)*	1.00	0.20	1.00	0.55
1=mother has some education	1.09	0.37	0.94	0.71
socio-economic quintile	1.22	0.00	1.16	0.06
1=urban	1.40	0.08	1.33	0.32
Center	0.94	0.74	0.84	0.56
East	1.25	0.26	0.90	0.72
% variation associated with cluster	23%		22%	

* entered at the mean

** odds ratios are associated with an increase from a quintile to the next higher quintile

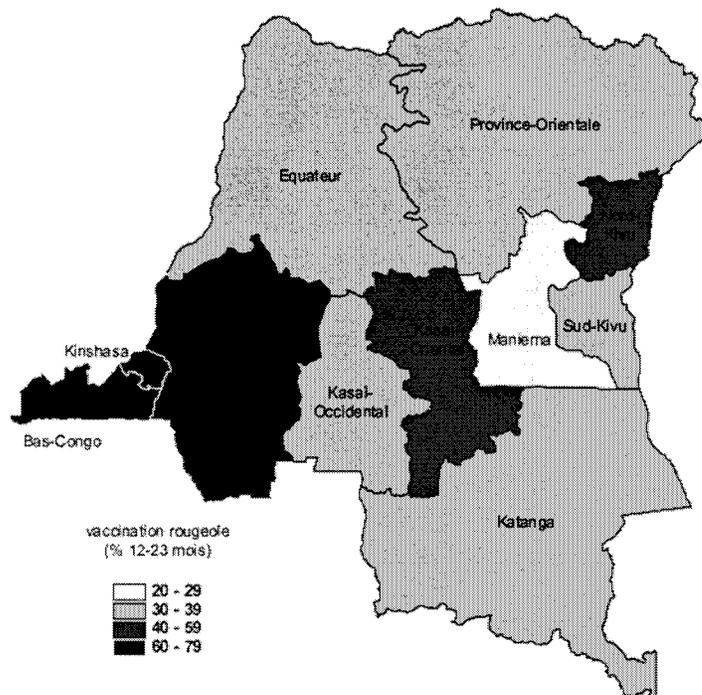
Reference region is West.

Estimation of significance accounts for survey design.

Authors' estimates with data from 2001 MICS2.

34. The poorest are less likely to utilize basic health services. Figure 2 shows that households in higher socio-economic status quintiles are more likely to utilize services. The regression models in Table 18 and Table 19 confirm the relationship between socio-economic status and health service utilization holds true after controlling for other determinants – particularly education and region of residence. The odds of utilization of the different types of services are 1.2 to 1.4 times greater when moving from one quintile to the next higher one.

Figure 18. Measles immunization, DRC, 2001 (% of children 12-23 months)

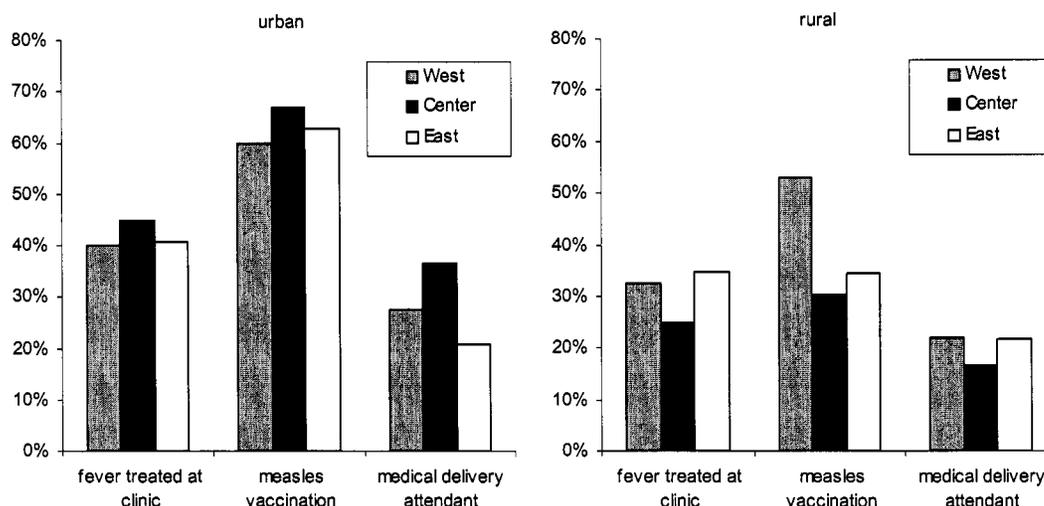


Authors' estimates with data from 2001 MICS2.

35. Residents of rural areas are less likely to utilize health services, both because they are poorer and because of less service availability. Figure 2 shows that, on average, utilization levels are lower in rural areas than in urban areas. For example, measles immunization coverage among the highest quintile in rural areas is around the same level as the lowest quintile in urban areas. The graphs also indicate that disparities are less evident in rural areas, suggesting a situation where the mass of the population has similarly low access to health services. Rural residents tend to be poorer than urban residents. The models presented in Table 18 and Table 19 control for socio-economic status, so that the effects on utilization associated with urban or rural residence can be attributed to other factors – with service availability a likely candidate. For example, compared to rural areas, the odds of measles vaccination are 3.13 times greater and the odds of treatment of fever are 1.40 times greater.

36. There are regional differences in immunization, but in general, differences in curative care are not so evident. Figure 18 maps differences between provinces in measles immunization coverage in 2001, showing that Kinshasa, Bas-Congo, and Bandundu, have the highest rates and Maniema the lowest. However, Figure 19 indicates that when looking at the regional level, differences in service utilization are not so evident, particularly treatment of fever and delivery care. This is confirmed by the models presented in Table 18 and Table 19, which account for differences in household socio-economic status. A significant effect associated with region is evident only with regard to measles vaccination.

Figure 19. Regional differences in health service utilization, DRC, 2001



Authors' estimates with data from 2001 MICS2.

37. This is contradictory with the regional differences in mortality and malnutrition discussed in Chapter 1, and can perhaps be explained by the importance of other contextual factors affecting health status – especially the economic and security situation. As well, it seems that deterioration of the health system occurred throughout the country, not just in the regions most affected by the conflict.

7. Trends

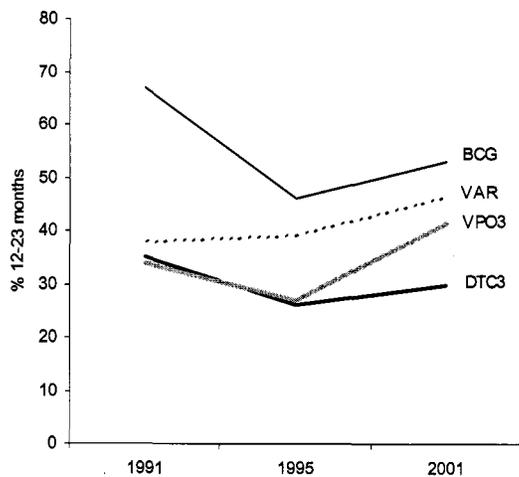
38. **Overall, utilization of basic curative services declined in the 1990s, while coverage of preventive interventions was more stable.** As discussed elsewhere in this report, the Congolese health system has been under severe stress for years. However, the system also seems to have surprising resilience in many cases. Utilization data can provide indicators about overall trends; based on the limited available data, it seems that coverage of preventive interventions may have held steady while utilization of curative care decreased in recent years.

39. **Although antenatal care coverage seems to have remained stable, utilization of skilled delivery care has declined in recent years.** Comparing the 2001 MICS2 estimates with a 1998 household survey by the Ministry of Health suggests that antenatal care coverage has remained stable, but utilization of trained delivery care has declined in recent years, both in urban and rural areas.

40. **Vaccination coverage seems to be starting to recover from declines during the 1990s, with improvements concentrated in rural areas and in the Center and East of the country.** Figure 20 shows estimated trends in vaccination coverage between 1991, 1995, and 2001. It shows that coverage declined during the first part of the decade, but seems to have improved to a small extent between 1995 and 2001 – despite the insecurity and conflict during those years. These trends reflect cuts in international assistance to the national program in the early 1990s, with resumption of assistance – often under humanitarian programs – later in the decade. These increases appear to be driven by trends in rural areas, where between 1995 and 2001 measles immunization rates increased from 28% to 37%, while urban areas experienced a slight decline from 72% to 67% in the same period. In addition, Table 20 shows that measles immunization coverage clearly increased in the Center and East regions, but hardly changed in the western

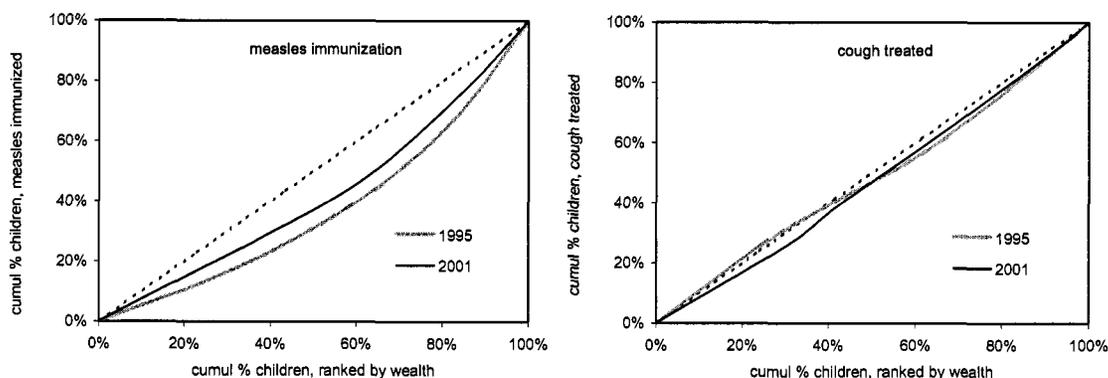
Provinces. This regional pattern can likely be attributed to vaccination campaigns under humanitarian programs.

Figure 20. Trends in vaccination coverage, DRC (% children 12-23 months)



Sources are 1991 Enquête Nationale de Couverture Vaccinale, 1995 MICS1, and 2001 MICS2.

Figure 21. Concentration curves for measles vaccination and treatment of respiratory infection, DRC, 1995-2001



Note that treatment for cough is from any "modern" source, including drug sellers. Authors' estimates with data from 1995 MICS1 and 2001 MICS2.

41. Utilization of basic curative child health services seems to have declined in the latter part of the 1990s everywhere in the country. Table 20 compares data from 1995 and 2001 on treatment of children with respiratory infection. For the purpose of comparability with the 1995 data, unlike estimates presented previously, these figures refer to any "modern" treatment, including from drug sellers. Nevertheless they indicate that access to basic curative treatment declined everywhere in the country.

42. Socio-economic disparities in immunization coverage decreased in the late 1990s, but change is less evident with regard to basic curative services. As discussed above, data from 2001 clearly shows that the poor are less likely to have access to both preventive and curative services. When comparing to 1995 data, socio-economic disparities in measles immunization remained large, but decreased over time. In Figure 21, the concentration curve moved closer to the diagonal, indicating greater equality in the distribution of measles immunization. Trends are less evident with regard to treatment of respiratory infection. (The fact that the estimates include drug sellers may obscure the relationship).

Chapter 2: Health Service Utilization

Table 20. Trends in health service utilization by region, DRC, 1995-2001 (%)

	measles immunization (children 12-23 months)		received treatment for respiratory infection* (under-5 children)	
	1995	2001	1995	2001
West	55.6	54.2	57.6	49.6
Center	23.7	50.5	51.6	41.8
East	26.1	39.1	59.6	52.2
overall	32.0	48.0	55.4	47.9

* includes drug sellers

Table 21. Pooled logistic regression model of the determinants of measles vaccination, children 12-23 months, DRC, 1995 (n = 1,035) and 2001 (n = 2,231)

	measles immunization (children 12-23 months) (n = 3,266)		treatment for respiratory infection (under-5 children) (n = 875)	
	odds ratio	p-value	odds ratio	p-value
Time: 0 = 1995, 1 = 2001	2.17	0.11	1.39	0.48
age (months)*	0.67	0.00	0.99	0.02
age2	0.97	0.00	1.00	0.66
1 = male	1.04	0.66	0.92	0.44
household size*	0.99	0.60	0.99	0.36
mother's age (years)*	0.99	0.20	1.00	0.89
1 = mother has some education	1.96	0.00	1.76	0.01
mother's education interaction with Time	1.03	0.92	0.53	0.02
socio-economic quintile**	1.46	0.00	1.16	0.12
quintile interaction with Time	0.87	0.22	0.97	0.80
1 = urban	3.82	0.00	1.54	0.17
urban interaction with Time	0.57	0.16	0.68	0.35
Center	0.33	0.00	0.78	0.45
Center interaction with Time	1.03	0.94	0.92	0.86
East	0.47	0.05	0.82	0.59
East interaction with Time	0.71	0.49	1.26	0.63
% variation associated with cluster	36%		20%	

* centered at the mean

** odds ratios are associated with an increase from a quintile to the next higher quintile

West is reference region.

Authors' estimates with data from 1995 MICS1 and 2001 MICS2.

43. Table 21 presents findings from an analysis of change in the determinants of measles immunization between 1995 and 2001, using a logistic regression model of pooled data from the 1995 MICS1 and 2001 MICS2. The findings seem to be consistent with the concentration curves in Figure 21. The model suggests that the odds of measles immunization were significantly greater among higher economic status quintiles in 1995, but this effect may have decreased by 2001 (although the interaction term is not statistically significant). With regard to treatment of respiratory infection, higher socio-economic status seems to be associated with increased utilization in 1995 (although the effect is not quite statistically significant), and there is no significant change in the effect in 2001.

44. The effects of mother's education on service utilization may have decreased over time.

The model presented in Table 21 shows that in 1995 a mother with any education was much more likely to get treatment for her child with respiratory infection (odds ratio of 1.76). However, the interaction term (with the "Time" variable) indicates that this protective effect was significantly reduced by 2001. This suggests that the conflict may have undermined the advantages educated mothers have – possibly by making curative services less accessible to everyone.

Chapter 3: The Health System

1. Organization of the health system

1. **With its health sector reforms of the 1980s, DRC was one of the first countries to emphasize primary care, an integrated referral system, and decentralization.** The adoption of a new health policy in 1981, the main theme of which was primary health care, was the point of departure for an in-depth restructuring of the health sector, and resulted in the emergence of the first decentralized entities, i.e., the Health Zones. In DRC, the concept of primary health care actually predates the Alma Ata Declaration. Indeed, the national colloquium in 1975 on community health care, chaired by the Ministry of Health and gathering together church-affiliated medical directors at the national and regional levels, adopted the principles of integrated care and proposed the creation of geographically-defined health zones and the decentralized management of health care services. In 1986, the national territory was subdivided into 306 Health Zones that serve as operational units for the provision of primary care. In 2001, DRC promulgated a new health policy that increased the number of Health Zones to 515 and aligned their boundaries with those of administrative districts.

Box 2. Estimating the impact of health care service availability on health outcomes

Quantitative studies on DRC have shown that health care availability has a positive impact on health outcomes. It is difficult to gauge empirically the impact of health care services on a population's health status, since other factors come into play. For example, high socio-economic status is very likely to be associated with both better health outcomes and greater utilization of health care services. While it is not easy to isolate the individual effects of all these interrelated factors, one can attempt to do this by means of regression models. Models of the determinants of child mortality indicate that the availability of health care services does indeed have a beneficial effect. A prospective cohort study of 776 children conducted over a 30-month period in the early 1990s in Bwamanda (province of Equateur), controlling for various other factors, showed that the likelihood of death was greater for families living more than 5 kilometers away from a health care facility (Van den Broeck, Eeckels and Massa, 1996).

Models indicate that the protective effect of health care service availability on child mortality increased during the war. Multiple regression analysis performed on data from the 2001 MICS2 aims to measure the relationship between an indicator of health care availability (proportion of children in the same community who have received BCG vaccination) and the number of children deceased, as reported by their mothers. The model controls for other possible determinants, in particular mothers' level of education, household socio-economic status, and geographic differences (See Table 8 in Chapter 1). The model shows that the indicator of health care availability is indeed associated with a lower risk of child mortality, especially over the long term. A model grouping data from the 1995 MICS1 and 2001 MICS2 suggests that, for more recent births, i.e., those occurring during the crisis period of the late 1990s, in the country's central and eastern zones most affected by the war, the protective effect of health care availability seems to have increased over time, whereas this effect is not evident in the western part of the country. (See Table 9 in Chapter 1). On the other hand, models of determinants of morbidity and malnutrition among children under the age of 5 generally do not show (except in the case of fever) that the health care availability indicator has any significant protective effects (see Table 10 and Table 11 in Chapter 1). The results of these models are consistent with the thesis by which morbidity and malnutrition depend to a great extent on economic, geographic and seasonal factors, whereas once illness strikes, the risk of mortality can be reduced through the availability of health care services.

2. **The supply of health services is decentralized, but the Ministry of Health also has a clear hierarchical structure.** The Health Zones have considerable operational autonomy, but they are far from constituting a federated system, since they are part of a hierarchical organization answerable to the Ministry of Health. The intermediate levels (District and Province) have considerable administrative power over the Health Zones, particularly where staffing is

concerned. The central level of the Ministry of Health primarily defines standards and policy, but also has considerable administrative authority in terms of oversight and management of personnel issues. However, given the Ministry's low budgets, the powers of the central and intermediate levels remain limited in practice, with the Health Zones and provincial and tertiary hospitals acting with a relatively large amount of operational autonomy. The Government has indicated its intention to move in the direction of financial decentralization, making the provinces directly responsible for social services and allocating to them an overall budget for this purpose. Nevertheless, under current proposals, some responsibilities associated with personnel, and particularly salaries, would be retained at the central level.

3. The central level of the Ministry of Health is responsible for general sector policy and system regulation, national programs, and tertiary hospitals. The national level of the Ministry of Health consists of the Minister, who exercises political authority; the General Secretariat of Health, which has administrative authority; the thirteen central directorates, including the 4th Directorate, responsible for the major endemic diseases and preventive measures, and the 5th Directorate, responsible for primary health care; and, finally, the specialized programs (52 in number) responsible for efforts to combat specific diseases, including malaria, HIV/AIDS, tuberculosis, etc. This is the level at which the design, coordination and organization of health policy, as well as interventions of national scope, are handled. The teaching hospitals, national hospitals, specialized hospitals, and national laboratories, are also located at the central level.

4. The Districts and Provinces are responsible for technical support and supervision of the Health Zones. The intermediate level is represented by the Provincial Health Directorate and its divisions, which organize and provide technical support to the Health Zones. All directorates of the Ministry of Health are represented at this level, as is the coordination of the various specialized programs. Provinces are subdivided into Health Districts, which are supposed to serve as an interface between the Provincial Directorate and the Health Zone, but are not completely functional. As of 2005, there were 65 District-level Health Inspectorates and 11 Provincial Health Inspectorates. In addition, there are 11 so-called Provincial Level Hospitals under the responsibility of the Provincial Directorates. Each Provincial Directorate is managed by a Provincial Inspector/Physician.

5. The Health Zone is the operational unit that integrates primary health care services and the first-referral level. A Health Zone covers an average population of 110,000 and consists of a Central Health Zone Office, an array of health posts and centers that provide the population with the Minimum Package of Activities defined by the Ministry of Health, a General Referral Hospital, offering a Complementary Package of Activities. Each Health Center serves an average of 5,000-10,000 people. The Health Zone is managed by the Chief Physician of the Zone, the General Referral Hospital by the Managing Physician (who is often the zone's Chief Physician as well), and Health Centers by Designated Nurses.

2. Network of health services

6. Data are poor on the supply of health services in the country, but it is generally deemed insufficient to meet the needs of the population. Geographic accessibility is a major obstacle to the use of health care facilities, especially in rural areas and on the outskirts of large cities. The increase in the number of Health Zones in 2001 was largely intended as an administrative framework for expansion of the health service network. Each Health Zone, for example, is slated to have a general referral hospital, which means that the country would have a deficit of about 60 hospitals (Révillion, 2005). However, such expansion will require substantial long-term investment. Table 22 shows the average number of inhabitants per Health Zone in each province.

Table 22. Number of Health Zones and population per Zone, DRC, 1986 and 2004

Province	No. of Health Zones in 1986	No. of Health Zones in 2004	Population per zone 2004
Kinshasa	22	35	140 038
Bas-Congo	27	31	80 982
Bandundu	38	52	144 515
Equateur	33	69	109 150
Kasaï Oriental	27	49	168 875
Kasaï Occidental	31	43	142 223
Katanga	40	67	128 692
Province Orientale	47	83	98 052
Nord-Kivu	19	34	142 020
Sud-Kivu	14	34	133 226
Maniema	8	18	95 295
Total	306	515	111 006

Source : Ministry of Health

7. Information on the number of functioning health care facilities is not up-to-date. Table 23 shows the ratio of inhabitants to health care facilities as of 1998, i.e., before the war. The ratios are not only higher than those in other Sub-Saharan African countries, but have also worsened since 1998 due to the destruction and pillaging of infrastructure during the war and the deterioration of the health care network.

Table 23. Number of inhabitants per health care facility, DRC 1998

	Urban areas		Rural areas	
	Standard	inhabitants per facility	Standard	inhabitants per facility
General Referral Hospital	150 000	293 598	100 000	163 794
Referral Health Center	20 000	100 924	15 000	62 676
Health Center	10 000	18 144	5 000	9 165

Source : Ministry of Health (1999a)

3. Private sector

8. **DRC has a true culture of public/private partnership in the management of health care facilities and in the provision of care, and a very large non-profit private sector.** The network of hospitals and health centers consists of facilities belonging to the State, religious denominations, enterprises and private parties. There are a number of faith-based organizations and NGOs with a significant presence in operating an array of health centers and hospitals at all levels of the health care pyramid. In many cases, the health care facilities of NGOs and faith-based organizations are well-integrated into the structures of the Health Zones, and often serve as general referral hospitals. This sector is believed to account for 50% of all in- and out-patient care. The network of religiously-affiliated health care facilities covers cities as well as rural areas, but the interventions of these organizations do not extend to all of the country's Health Zones. Due to inadequate Government financing for public health facilities, NGOs have acquired a reputation for delivering care of better quality.

9. **The for-profit private sector has expanded considerably in cities, but remains very small overall.** Since the late 1980s, the private sector has developed significantly, mainly in the capital,

Kinshasa, and in other urban centers. Initially consisting of establishments offering nursing care, it quickly broadened its scope to include all levels of medical care. It is also involved at all levels of the health care pyramid and includes health posts, health centers, maternity clinics, specialized hospitals with more or less sophisticated and differentiated services, medical testing laboratories, and diagnostic imaging centers. It is not known how many of these facilities exist, or what their service capacity is, but it is believed that the private for-profit sector in general is still relatively small.

Box 3 : Hospitals in DRC

Hospitals have always been an essential part of DRC's health system. Historically, the boundaries of Health Zones were drawn around the country's existing hospitals, most of which were established by missionaries. Although the Congolese government is now the owner of most of the country's hospital facilities, many of them are still managed by religious organizations under partnership arrangements. The general referral hospital may be considered the cornerstone of the integrated Health Zone system, as it provides referral services and technical and managerial support to the network of health centers and health posts. However, current external support to the sector does not, in general, include significant investment in, and support of, these facilities. Projects rehabilitate and partially equip some departments (e.g., maternity wards, laboratories, etc.), support training and drug purchases, and ensure the safety of transfusions if this is not handled by a vertical program. Due to the increased number of Health Zones and the Government's goal of putting a general referral hospital in each Zone, the investment requirements are considerable: an estimated US\$90 million for the sector as a whole. Many general referral hospitals require not only extensive rehabilitation and complete re-equipment, but also significant financing if their services are to be affordable for the populace.

Hospitalization costs are indeed unaffordable for many people. A Caesarian section, for example, costs about US\$100. Apart from financial affordability, geographic accessibility is also problematic. Due to the poor condition of the transport network, hospitals can usually only be reached by bicycle and on foot. Some health centers are over 100 km from the hospital and can be reached only via motorbike. It is thus impossible to evacuate a patient in serious condition, all the more so since the centers have no means of communicating (by telephone or radio) with the hospital, and the latter usually has no ambulance for transporting patients. (Révillion, 2005)

The provincial hospitals are an integral part of the Government's strategy in the health sector, but this fact has not yet expressed itself in the form of operational activity even though some large urban establishments (e.g., *Mama Yemo* in Kinshasa) are officially designated as provincial hospitals. Due to the ongoing lack of significant financing and investment from the government, these institutions have a great deal of autonomy and are only loosely integrated with structures at the lower levels.

From a legal standpoint, the Hospitals Directorate within the Ministry of Health is responsible for secondary and tertiary-level (i.e., national and provincial) structures, but its interventions remain limited due to the essentially complete managerial autonomy of these establishments. As for the 5th Directorate (primary care), it is responsible for first-level referral facilities (general referral hospitals) within the context of the Health Zones. Hospital staff salary costs are generally financed by the Ministry of Health, supplemented by revenues derived from users' payments.

10. Regarding their geographic distribution, private health care facilities are mostly concentrated in Kinshasa, but they are also found to some extent in the other large cities. They are essentially implanted in places where the population can afford their services. Although dispensaries and health posts are found more or less throughout rural areas, the same is not true of medical clinics, which prefer to concentrate on specialized services that are more profitable, more costly, and out of the reach of rural populations. The fees are generally higher than those applied by public establishments or private non-profit facilities, but information on this subject, as well as on the quality of the services they offer, is generally lacking.

11. **There are reports of the existence of informal healers and medicine sellers who provide services of questionable quality, but little information is available about them.** In addition to

traditional healers, there are informal unqualified providers who offer health services in many regions. Drug sellers are particularly active to the extent that their drugs and advice are generally less costly than the treatments offered in formal public or private establishments. The quality of these services is doubtful, but there is little information on them.

4. Services and quality

12. DRC has a clearly-defined Minimum Package of Activities (MPA) offered in health centers and health posts, and Complementary Package of Activities (CPA) provided by first-referral hospitals. However, few health care facilities provide all of the services included in the standard packages. The services contained in the MPA, offered at health centers and health posts, are divided into promotional, preventive, and curative health care activities. They essentially include neonatal and maternal preventive care (e.g., tetanus shots, provision of iron and folic acid supplements, etc.), pediatric preventive care (e.g., immunization, vitamin A supplementation, promotion of breastfeeding, etc.), and the management of maternal, neonatal and childhood diseases (mainly those targeted by the specialized programs of the Ministry of Health). In addition to these services, testing and treatment for certain communicable or chronic diseases, such as HIV/AIDS, tuberculosis, leprosy, high blood pressure, etc., are also included in the MPA. The general referral hospitals are responsible for supplying the services included in the CPA, including pediatric, internal medicine, gynecological and obstetrical services, as well as general surgery, as well as medical analysis and diagnostic imaging facilities and a blood bank. In addition to an array of preventive services, they are mainly in charge of handling cases referred by the lower-level structures.

13. Within the context of DRC, it is difficult to gauge the extent of the services actually provided in the various health care facilities, although studies in specific districts and provinces may provide an idea of the situation. Due to the chronic shortage of financial, material and human resources, the available information suggests that a large proportion of health centers and health posts do not offer all, or even most, of the services included in the minimum package. A survey of 56 health posts selected throughout the country (NGO- and State-run) reveals that 32% are not providing child health care services, 50% are not offering obstetrical services, and 91% are not prepared to handle or counsel HIV/AIDS patients (BERCI, 2004). Some activities, including mobile service strategies, are not being implemented due to the lack of material resources and inputs.

14. Family planning services are often unavailable in health care facilities, even though they are included in the MPA. Of 191 persons queried in a survey in Nord-Kivu province, 63% stated that condoms were available in private pharmacies, while only 9% said that they could be obtained from health centers (Soeters, 2003). In a survey conducted in Kasai-Oriental (n = 356), 37% of those queried indicated that condoms were available in health centers. (PSF, 2003).

15. At the higher levels of the health care pyramid, the CPA services are also sometimes unavailable at the general referral hospitals and provincial hospitals. The same study (BERCI, 2004) reports that, of a total of 56 hospitals surveyed, about two-thirds have no X-ray equipment, over a third lack a gynecological examination table, and over 20% are operating without a centrifuge.

16. The health system's response to sexual violence is limited to small-scale NGO programs. A small qualitative study conducted in Eastern DRC in 2002 indicated that health care services provided to the victims of sexual violence are generally of poor quality. Victims are not provided with emergency contraception, to say nothing of emergency anti-retroviral drugs (ARVs); they are often denied treatment, with the result that their stigmatization is exacerbated (Casey, 2002). Some NGO programs have attempted to address this problem in the most affected regions.

17. The technical quality of services deteriorated significantly during the 1990s, but the situation seems to have improved perceptibly with the resumption of development cooperation and the process of revitalization of health services. DRC lacks a quality control, accreditation, or certification agency; there is therefore no information on service quality at the national level. However, a number of surveys of health facilities, conducted by NGOs in several districts and provinces, provide a picture of the situation.

18. A study carried out in the Ituri and Haut Uélé districts in the Orientale province evaluated, in a set of Health Zones, the extent to which diagnoses and treatments prescribed in health centers and general referral hospitals conformed to medical standards. (Maltheser, 2004) Prior to the NGO's intervention in 2002, the proportion of diagnoses conforming to disease symptoms varied greatly from one Health Zone to another, but rarely exceeded 50%, suggesting that nearly half of diagnoses were erroneous. Drug prescriptions conforming to the stated diagnosis accounted for, at best, 45% of all prescriptions. The same study noted overuse of antibiotics and of injectable forms of drugs. Another study conducted in Nord-Kivu (Soeters, 2003) presents a similar situation: overuse of injectables, use of non-sterile surgical materials, transfusions of untested blood, and use of treatments or interventions without therapeutic indication, such as appendectomies, Caesarian sections, and intravenous drips. A survey of 35 hospital facilities in the city of Kinshasa (Kahindo, 2002) indicated that only one had undergone a medical audit during the six months preceding the survey. Only one of the 35 facilities visited had regularly gathered and analyzed data on hospital-acquired infections. Over one establishment in five failed to carry out routine cleaning of the operating room between procedures, and of those that did so, only 15% followed a protocol.

19. With the resumption of development cooperation and the process of revitalizing health services, an improvement in the technical quality of services is expected. Staff retraining and the provision of equipment and consumables to health facilities have brought perceptible improvement to some regions. For example, NGO support in the Orientale province improved the percentage of correct diagnoses and prescriptions and, therefore, patient care. (Maltheser, 2004)

20. Despite technical deficiencies, users' perception of service quality is generally positive, except with regard to cost of care. Church-affiliated establishments seem to be rated higher than State-run structures. Satisfaction surveys indicate that the users of health facilities are generally satisfied with the quality of care received, whether in urban or in rural areas, and this applies to all provinces. A survey of hospital users in all provinces (except for Kasai Occidental and Orientale) (BERCI, 2004) indicated that over 80% (n = 3,304) deemed intake procedures to be satisfactory or very satisfactory; 47% felt that they were always treated respectfully and courteously by the care personnel, while 35% indicated that respect and courtesy were 'sometimes' in evidence (n = 3,016). Only 6% of users claimed that they were always treated disrespectfully, as against 60% who said that they were never treated disrespectfully. The rate of satisfaction in terms of positive outcome of treatment was also high, with over 80% of users satisfied or very satisfied with their treatment (n = 3,002). Regarding waiting times, over half of the users in this study felt that they were long or too long, while 34% found them acceptable. Rather surprisingly, only 2% of users who were dissatisfied with the treatment received mentioned the problem of a shortage of drugs. The lack of other materials is, however, mentioned by 25% of those questioned. Most patients deplored the high cost of consultations and treatments, which they wished to see reduced.

21. The study in Nord-Kivu (Soeters, 2003) corroborates the preceding conclusions, with nearly 90% of users satisfied, 88% finding care personnel courteous, and 77% satisfied with waiting times in health care facilities. The rate of satisfaction with treatment outcome was about 66%. This study also pointed out users' preference for church-affiliated facilities (50%) over community-run structures (32%) and private dispensaries (8%). The main reasons invoked for

this preference were good quality of care and courteous reception. Users of private dispensaries emphasized the speed of intake procedures, but not the quality of care.

22. Another survey of 510 households conducted by the NGO PSF in Kasai-Oriental indicated lower rates of user satisfaction, with nearly 60% indicating that care was of good quality, 64% that drug availability was good, 67% that the staff was courteous and respectful, 56% that waiting times were reasonable, and 49% that they were cured by the treatment received. A slight preference for private (i.e., not community-run) facilities was noted.

23. The relatively high patient satisfaction rates are at odds with the poor technical quality of care, but may be explained in several ways. First, it should be noted that those queried about quality were those who had actually received care, as opposed to the large proportion of the population that lacks access to care. The results of the aforementioned studies are probably not representative of the general perception of quality. For example, the BERCI study was conducted in the largest health care facilities in the selected health zones, where services are generally reputed to be of better quality than in rural areas. The observations of the Nord-Kivu study may be linked to the high level of external assistance to the health sector in this province. The survey in Kasai Oriental, where external assistance is less extensive, reveals lower levels of satisfaction. In addition, satisfaction surveys conducted in other African countries produce similar results under conditions where quality is poor, suggesting that most users have low expectations. Indeed, some poor quality care practices, such as the systematic use of injectable forms of drugs and antibiotics, are partly the result of patients' demands.

24. However, these results on patient perception, along with the observation on the use of health centers (30-40% of cases of children's illnesses are handled in a health care facility) (Table 17), suggest that **the demand for services at facilities run by the Government, NGOs, and religious organizations is potentially large**, and represents a solid basis for the reconstruction and development of the health care system.

5. Community participation

25. **Mechanisms exist for involving the community in health system management, but they are non-functional in many cases.** The model adopted by the DRC in the mid-1980s for decentralizing health care requires the strengthening of community participation in the management of health care services, with a view to improving the responsiveness of the system. There are currently management committees – that include community representatives – for many health care facilities, but they are not always operational. Although these management communities do meet occasionally, in many cases they do not have influence over the management of staff, equipment, finances, or purchases of medical supplies. There is no formal framework that clearly sets out the prerogatives of these entities. A 2001 study in Kinshasa indicated that only 29% of facilities had a management committee. (OCHA, 2001) Conversely, a study of 59 health centers (some of which were urban) throughout the country found that 85% of health care facilities had a 'health committee' whose stated role was to serve as a liaison between the population and the health care establishment, to educate the population, and to ensure proper management of the facility (BERCI, 2004).

6. Human resources

26. **The number of physicians in the DRC is low by any standard, whereas the number of nurses is larger than in other very poor countries.** At the national level, available data indicated, as of 1998, a relatively high number of nurses, compared to an alarmingly low number of medical doctors (Table 24). The ratio of 1,700 inhabitants per nurse meets the standard set out

by the Ministry of Health. However, the physician shortage is very severe, with over 22,000 inhabitants per physician, compared to the standard of 10,000. These figures can also be presented in the form of ratios of staff per 100,000 inhabitants, for the purpose of facilitating international comparisons. In 1998, the DRC had about 4.4 physicians per 100,000 inhabitants, a figure that is among the world's lowest, although in keeping with the country's poverty level (Figure 22). The country also had, as of 1998, about 58 nurses per 100,000 inhabitants, a figure higher than that observed in other very poor countries, but still low by international standards.

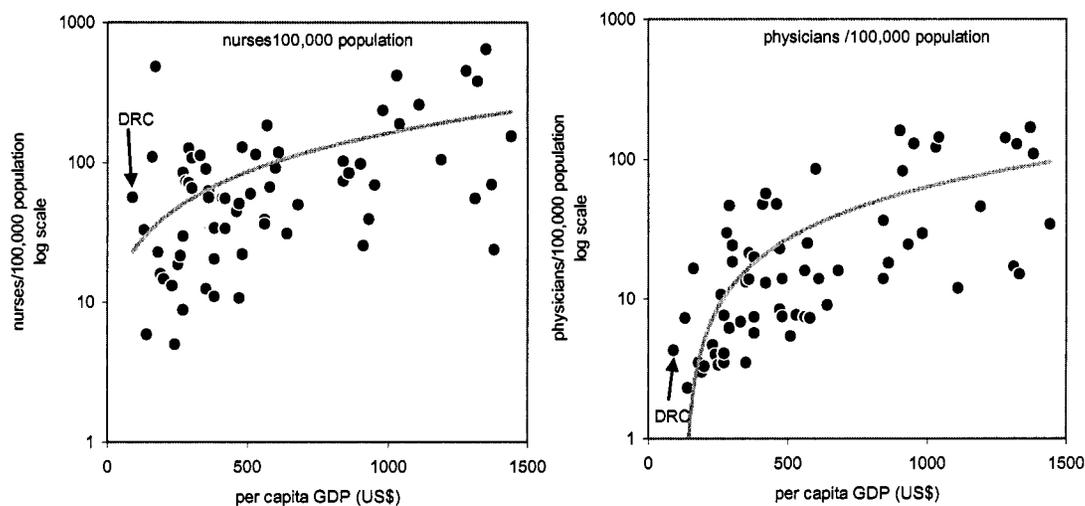
Table 24. Availability of human resources in the health care sector, DRC, 1998

Professional category	No. in urban areas	No. in rural areas	Total in DRC	Ratio of population/personnel			
				standard	urban	rural	DRC
Medical doctors	1 406	650	2 056	10 000	6 891	56 698	22 637
Dentists	89	11	100	30 000	99 884	3 071 146	426 995
Pharmacists	85	36	121	50 000	113 985	1 023 715	384 649
Administrators/Managers	295	227	522	50 000	32 843	162 351	89 162
Nurses	9 800	17 362	27 162	5 000	989	2 123	1 714
Lab technicians	188	62	250	5 000	51 536	594 415	186 170
Radiology technicians	134	44	178	15 000	72 304	837 595	261 471
Nutritionists	85	91	176		113 985	404 986	264 446
Physical therapists	101	38	139	15 000	95 928	962 836	334 838
Anesthesiologists	80	19	99	15 000	121 109	1 939 671	470 126
Pharmacy assistants	90	43	133		107 653	857 064	349 944
Hygiene technicians	52	64	116	15 000	186 322	575 840	401 228

Source : Ministry of Health (1999a)

Estimates of the authors based on WHO and World Bank data.

Figure 22. Physicians and nurses per 100,000 population, DRC, 1998

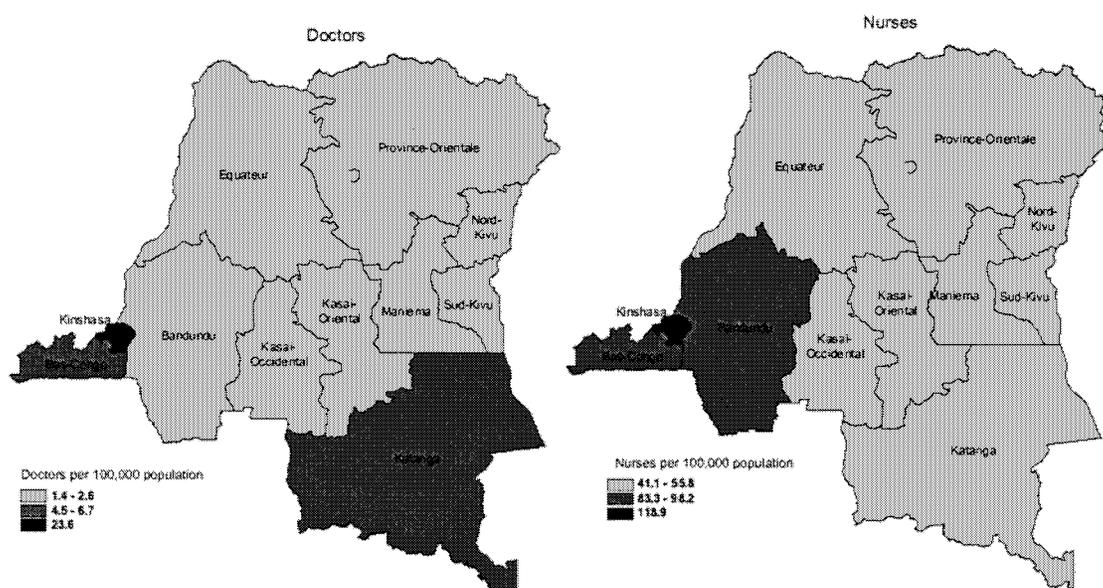


27. **Qualified health care personnel are concentrated in the city of Kinshasa.** Figure 23 shows clearly that the great majority of physicians and nurses are based in Kinshasa, where there were 24 medical doctors and 120 nurses per 100,000 inhabitants in 1998. The province with the second-highest number of qualified health personnel is Bas-Congo, with about 7 physicians and

100 nurses per 100,000 inhabitants. The rest of the country has fewer than 3 physicians and 60 nurses per 100,000 inhabitants.

28. Available data indicate that the number of physicians has declined steeply throughout the country since 1998. The situation has changed somewhat since 1998. Table 25 compares the most recent data on the number of medical doctors with the 1998 figures. The number of physicians has declined in all provinces for which recent data are available, including the province of Kinshasa. Taking population growth into account, it is estimated that the ratio of physicians per 100,000 inhabitants has dropped by 30-50% in most provinces, and by 75% in Katanga.

Figure 23. Physicians and nurses per 100,000 population, DRC, 1998



Estimates of the authors based on data from the Ministry of Health (1999a).

29. Rural areas suffer from a greater shortage of physicians than urban areas, but the average number of nurses in rural areas meets the standard. For example, the province of Equateur in 1998 had 1.2 physicians per 100,000 inhabitants in rural areas, and 3.9 in urban centers. For the country as a whole, these ratios were 1.8 physicians per 100,000 inhabitants in rural areas and 14.5 in urban areas. It is important to note that, outside the city of Kinshasa, no other province (either rural or urban) in the entire country meets the standard of 10 physicians per 100,000 inhabitants. Inequalities also exist in the rural/urban distribution of nurses, who in 1998 numbered about 47 per 100,000 inhabitants in rural areas, and about 100 per 100,000 inhabitants in urban areas. However, the average availability of this personnel in rural areas meets the official standard of 20 nurses per 100,000 inhabitants.

30. Capacities for human resource planning and management need to be strengthened. Weak managerial capacities and the lack of staff management on the part of the Ministry of Health are evident. At the institutional level, there is a notable absence of a human resource development plan that might guide policy options in this area, while taking into account the potential and capacities of the private sector. The Ministry of Health reports a staff totaling 84,000 civil servants, of whom 40,000 are actually in service and 18,000 eligible for retirement, but the lack of administrative files on most staff and the absence of effective physical monitoring of staff numbers makes it easy for 'phantom' employees to proliferate and fosters inefficient use of the country's already scarce resources. These various problems are currently receiving

scrutiny within the framework of an institutional audit of the Ministry of Health and in connection with broader efforts to reform the civil service.

Table 25. Physicians per 100,000 population, DRC, 1998-2003

Province	No. of physicians 1998	No. of physicians 2003	Change (%)	Physicians per 100,000 inhabitants 1998	Physicians per 100,000 inhabitants 2003	Change (%)
Kinshasa	950	699	-26%	23.6	14.8	-37%
Bas-Congo	159	101	-36%	6.7	3.6	-46%
Bandundu	100	89	-11%	1.9	1.4	-24%
Kasai Occidental	71	56	-21%	1.7	1.1	-33%
Kasai Oriental	105	58	-45%	2.6	1.2	-53%
Equateur	80	64	-20%	1.4	0.9	-32%
Province Orientale	119	64	-46%	1.9	0.9	-54%
Maniema	22	..	..	1.6	..	..
Nord-Kivu	89	..	..	2.5	..	..
Sud-Kivu	80	..	..	2.6	..	..
Katanga	281	87	-69%	4.5	1.2	-74%
DRC	2,056			4.4		

Estimates of the authors based on data from the Ministry of Health.

31. DRC has several training establishments that constitute a basis for human resource development in the sector, but they are currently under-funded. In the area of training, the DRC has an important asset in terms of capacity to produce qualified health personnel. The country has three State-run medical schools and about twenty more or less viable ones run on community initiative, a national school of public health with a 12-month training cycle leading to a master's degree, and about two hundred nurses' training institutes scattered throughout the country.

32. It would appear that the programs are not always a good fit with the country's socio-economic realities. The production of public health professionals capable of practicing their profession in a way that is in keeping with the country's environment and mainly rural population is de-emphasized in favor of the teaching of modern, sophisticated medicine. The result is that few physicians accept assignments in poor regions and rural areas, which are deemed hardship postings due to the lack of modern conveniences (running water, electricity, schools, etc.), and because of the severely deteriorated condition of health care infrastructure. Less demanding paramedical personnel seems better adapted to the rural milieu and are better distributed throughout the country. This state of affairs is aggravated by the lack of incentives in support of a strategy for redeploying personnel to the disadvantaged zones. In the absence of in-service training, the qualifications of staff in post also present a problem.

33. Emigration of health care professionals negates the Government's investment in their training. Emigration of medical doctors in general and of specialists in particular is a significant factor in the observed staff shortage. The appeal of the international market has been enhanced by the crisis experienced by the country. Many health care professionals, and particularly highly skilled physicians and specialists, have gone abroad in search of better salaries and living conditions. Indeed, it is estimated that over 1,000 Congolese physicians are practicing in the countries of southern Africa.

34. Salaries are so low that performance bonuses have become important sources of income.

Not only are payments and salaries in the civil service deemed low (US\$15-20 per month for the chief physician of a zone and less than US\$50 per month for a provincial medical inspector), but the State is often several months behind in salary payments. The staff of health services supported or managed by NGOs or religious associations are generally more motivated and more efficient than in the public sector. Indeed, bonuses are often higher than State salaries. These bonuses are highly variable. A study conducted in 2005 found, for example, that staff incentives paid to Health Centers ranged from US\$40 to US\$200 per month, and those for general hospitals were between US\$200 and US\$2,400 per month, whereas the central bureaus of health zones received between US\$350 and US\$1,000 per month. (Révillion, 2005).

35. The concentration of private for-profit facilities in Kinshasa and in large urban centers also provides some explanation for the distribution of staff in the various provinces of the DRC. Cities offer much more opportunity for double duty. In addition to a guaranteed job in the civil service, many physicians, nurses, and midwives work additional hours in private establishments in order to supplement their incomes.

7. Pharmaceutical sector

36. Following the withdrawal of Government support to the health sector over the past decades, most health care facilities use their own resources to obtain drugs and consumables. The national system of drug supply and distribution largely ceased to operate in the 1990s due to the cessation of government financing and outside support. Supply then became highly fragmented, inefficient, and costly, with health facilities and health zones obtaining drugs from the available private suppliers. A 2003 study of those supplying health facilities in three different regions found that 29% of facilities were getting their supplies from private suppliers, 52% from external support, and 19% from regional distribution centers.

37. Church-affiliated associations and external partners, as well as NGOs and some specialized programs, provide drugs and supplies for many health services. Some special programs responsible for combating endemic diseases have developed supply systems for their specific needs, and resort either to church-based networks or to their own supply sources. This is the case, in particular, with the Expanded Program on Immunization (EPI), which has its own relatively efficient supply chain. Church-affiliated networks and international NGOs play important roles in supplying the health facilities that they support. In several cases, the supplies they provide to health facilities take the form of standardized kits.

38. The private for-profit pharmaceutical sector has expanded, but it is still largely unsupervised and concentrated in large urban centers, and particularly in the city of Kinshasa. It includes wholesale importers, private pharmacies, and several illegal points of sale. It is the main source of supply for health facilities and Health Zones that have no support from local or international partners. There are currently nearly 65 wholesale importers; they are distributed over the country in accordance with the laws of the market, and are thus highly skewed towards urban areas. In 1998, there were about 121 registered pharmacists throughout the country. A 2004 survey of 39 private pharmacies distributed among the country's main cities found that 82% of them got their supplies from local suppliers and 8% had international sources of supply. (BERCI, 2004). This same study found mixed results in terms of quality: 42% of these pharmacies had no pharmacist on staff and 38% kept no records of prescriptions.

39. The internal production capacities of the DRC have mirrored the country's economic deterioration. The pharmaceutical industry is in its infancy and the country essentially gets its supplies on the international market.

40. The scope of the informal sector is currently unknown, but it is an important source of supply for the population despite the questionable quality of its products. There is limited information available on this topic, except for household surveys indicating that nearly a third of sick people turn to sellers of medicines rather than to formal sector practitioners.

41. **The cost of medicines is largely borne by households.** In health facilities, the price often includes large margins intended to pay the salaries of health care personnel. At the level of the Health Zones, the sale of medicines in accordance with the recommendations contained in the Bamako Initiative disappeared with the stoppage of external aid. However, stocks are rotated due to the sale of medicines by personnel to users, with high margins intended to cover their pay. In zones supported by NGOs, and particularly by the humanitarian programs, medicines are often subsidized by external aid. The level of subsidy needed in order to improve utilization of health care services and, ultimately, the country's health outcomes, is still a major concern for the Government and donors.

42. **A national pharmaceutical policy has been adopted and efforts are underway to improve the distribution system.** The DRC has had since 1987 a list of essential drugs, revised in 1991 and again in 2001 after the adoption in 1999 of the national pharmaceutical policy. A study conducted in 2002 pointed out the fragmented and inefficient nature of the drug distribution system, and led to the development of a strategy for improved coordination of purchasing and distribution; it is being implemented progressively. The reorganization of the sector, characterized by a commitment to the decentralization of supply, has led to the development of about 10 Regional Distribution Centers financed by external partners. Experiments underway involve three centers financed by the European Union, five financed by the World Bank, one financed by the Belgian Cooperation, and the 10-year-old ASRAMES purchasing center in Nord-Kivu, which has just been integrated into the system. The desire to centralize purchasing has led to the creation of the regional distribution agency FEDECAME [*Fédération des centrales de distribution régionales*], the main function of which is to centralize purchases.

43. **University-level pharmacy programs are operational but are short on resources.** There are two pharmacy faculties in the country, in Kinshasa and in Lubumbashi; they had 651 students as of the 2004 academic year. Due to the lack of Government funding, these institutions are financed by fees paid by students. The study conducted by BERCI in 2004 noted a lack of basic equipment and consumables.

8. Health information system

44. **A system of health surveillance and information is in place, with standardized reporting forms, but problems with duplication and underreporting are still apparent.** The National Health Information System [*Système national d'informations sanitaires*, SNIS] is designed to collect and share data between the various layers of the health care system, from the community level up to the Ministry of Health. The detection and reporting of cases is done by the staff of the Health Centers or referral hospitals. Data collection is done at the peripheral level by the Central Bureau of Health Zones; it conveys the data to the Provincial Health Inspectorate, which in turn transmits it to the Ministry of Health. Standardized and simplified data collection forms have been developed.

45. Alongside this data collection system, there are other systems with different criteria for the production of figures. For example, surveillance data on priority diseases is gathered by the 4th Directorate, polio surveillance is performed within the framework of the polio eradication program, and the EPI also collects vaccination data.

46. Several shortcomings impair the credibility of all of the data thus collected. Given the low level of utilization of health facilities, one is justified in fearing a great deal of underreporting. In addition, it is estimated that about 40% of Health Zones submit incomplete activity reports that fail to cover all of their facilities. Private facilities, even if they belong to the formal sector, are generally not part of the data-gathering process. The denominators – usually the size of the target population of the various interventions – are poorly known, and this situation has worsened due to the population movements that the country has experienced.

9. Important programs

47. **A number of specialized programs are responsible for combating priority diseases and supplement the services put in place in the Health Zones.** The DRC has established several programs to combat certain priority communicable diseases that impose a heavy burden of morbidity and mortality on the population as a whole and particularly on the most vulnerable groups, women, and children. The Ministry of Health oversees these various programs, which include the EPI and the national programs to combat malaria, tuberculosis, HIV/AIDS, leprosy, sleeping sickness, river blindness, and iodine deficiency disorders. They are managed by Directors responsible for the coordination of all of the programs' administrative, financial, and technical activities. At the intermediate level, linkages are provided by the Provincial Medical Inspectors [*Médecins Inspecteurs Provinciaux*] who are assisted by the District Physicians [*médecins de district*] and provide technical and material support to the Health Zones. The Central Bureau of a Health Zone represents the various programs at the peripheral level and, at this level, the Chief Physician of the Zone has the task of integrating the disease-prevention activities into primary health care activities.

Anti-malarial efforts

48. **The DRC is following the international "Roll Back Malaria" strategy, emphasizing the distribution of bednets and effective treatment.** The five-year plan for combating malaria (2002-2006) follows this global framework, and its basic strategy has four main themes: treatment of cases, prevention, epidemiological surveillance, and institutional capacity-building.

49. The treatment of uncomplicated cases involves households, community-level health personnel and the health centers. The strategy adopted recommends the administration of first-line anti-malarial medication in the event of any isolated instance of fever. Serious cases of malaria are referred to the general referral hospital or to the relevant facilities for appropriate treatment. Prevention depends on informing the population about the use of insecticide-impregnated nets, intermittent presumptive treatment for pregnant women, and to a lesser extent, on environmental measures.

50. **The treatment protocol has been revised due to the parasite's growing resistance to current drugs.** Following studies in 2000-2001 assessing the resistance of the *Plasmodium falciparum* to anti-malarial drugs, which found a 29-80% rate of resistance to chloroquine, the recommended first-line treatment was changed to the sulfadoxine-pyrimethamine (S-P) combination. However, the parasite's growing resistance to S-P (ranging from 2 to 61% in five locations from 2002 to 2004) has prompted the Ministry of Health to change the national anti-malaria policy to make therapeutic combinations based on artemisinin the first-line treatment in regions where resistance is particularly high. Some international NGOs have begun to implement this therapy, but on a limited scale.

51. **Thus far, the coverage effective preventive and curative interventions are still limited.** The population generally lacks information about proper treatment of cases of malaria and when

to seek care. It is also under-informed about preventive activities, especially in rural areas. The health system relies upon community-level health personnel to relay information to communities and households, but their effectiveness is limited. In the absence of health information and education, and given the inadequacies of the system generally, households are still relying to a great extent to itinerant sellers of medicines. In health centers, some staff administer quinine as a first-line treatment if the patient can afford it. Intermittent chemical prophylaxis in pregnant women is still very uncommon (5%). As part of its effort to provide the population with the means to prevent and combat malaria, the Government initiated the distribution of nets in some Health Zones in 2000, with the assistance of international partners. In 2001, less than 1% of children under the age of five were sleeping under mosquito nets impregnated with insecticide. By 2004, only 24,000 mosquito nets had been distributed, as against a goal of 500,000 for the 2003-2004 period.

52. The availability of additional financing should improve the situation, but the programs, as planned, can only cover part of the population. In 2004, the Global Fund approved a five-year US\$54 million program to combat malaria (US\$25 million over the first two years), thereby supporting the main components of the national strategy (i.e., distribution of insecticide-treated nets, treatment of cases, and intermittent presumptive treatment for pregnant women). Acknowledging that these resources are inadequate to cover the entire population, the program involves 120 Health Zones and aims for a coverage rate of about 50% within each zone. A new World Bank health project includes a malaria “booster” component which allocates US\$ 30 million to malaria interventions in 150 Health Zones.

HIV/AIDS prevention

53. The DRC has a national HIV/AIDS prevention program with a multisectoral strategy. In 1987, the DRC implemented a national AIDS prevention program. At the policy and organizational level, the Multisectoral AIDS/STD Prevention Committee has the task of defining national policy in the fight against the pandemic, validating the national action plan, and assessing the effectiveness of the program’s efforts and activities. The National Program to Prevent HIV/AIDS, Sexually Transmitted Diseases and Opportunistic Infections (French acronym : PNLS/IST) is the framework within which the various preventive efforts are coordinated. The program’s objectives are to mobilize civil society, to improve access to preventive services, to diagnose and treat, and to strengthen the capacities of the institutions and actors involved in the effort. In its activities, it is supported by linkages at the provincial level and at the level of the Health Zones. The involvement of the various actors in the sector – including NGOs, private enterprises, and church-affiliated associations – has created several coordination mechanisms aimed at obtaining a certain synergy of action.

54. HIV/AIDS prevention activities, suspended during the 1990s due to the crisis, have thus far had a limited impact. To date, the results of various interventions carried out in the fight against AIDS have been relatively disappointing. This situation was aggravated by the withdrawal of the various donors in 1993, and the crisis made it impossible to effectively coordinate prevention activities.

55. The population’s level of knowledge and education needs to be improved. Educational activities and advocacy towards safe sexual behaviors are being conducted, mainly by non-profit associations. They are being carried out in health care facilities and schools, and through the mass media. Unfortunately, they do not seem to be very effective with the population, judging by the level of knowledge of AIDS and ways to avoid it on the part of women of childbearing age (in

2001, only 10% of such women had accurate information on the disease).¹⁸ Moreover, the promotion of condom use is not being accompanied by efforts to disseminate them or to make them available to populations already reluctant to use them, particularly in rural areas where points of sale are scarce.

56. Activities aimed at preventing mother-to-child transmission are still at the pilot project stage, with interventions at about thirty sites in the three provinces of Kinshasa, Bas-Congo and Sud-Kivu. These activities consist of testing, with informed consent, followed by free provision of the antiretroviral (ARV) Nevirapine to AIDS-infected women, or nutritional counseling about breastfeeding for the others.

57. Voluntary testing and advisory services are still very limited. The three main components of the treatment of persons living with AIDS, i.e., diagnosis, treatment of opportunistic infections, and access to ARVs, scarcely have enough resources for their effective and efficient implementation. The country has only ten centers for voluntary and anonymous testing.

58. Effective treatment of opportunistic infections is hampered by the inaccessibility and poor quality of hospital services. The poor quality of treatment given to opportunistic infections in the internal medicine departments of hospitals, where high mortality rates (estimated at 70%) are observed, spurred the PNLs in 2002 to publish a guide on the treatment of these infections, with a minimum package of activities to be included in hospital services. However, the weak purchasing power of the population and the general scarcity of drugs facing most of the country's health care facilities are undermining the effectiveness of this initiative.

59. Access to antiretroviral therapies is still very limited. Access to ARVs is still as problematic in the DRC as it is in the other countries of the region. High cost remains a major obstacle to the treatment of patients. In addition to this factor, there is a shortage of trained personnel, especially at the lower levels of the health care pyramid.

60. Improving the safety of blood transfusions is still a major challenge, despite significant progress. The State still has little control over the blood chain. It is reported that about 60% of hospitals lack blood banks. Apart from the General Hospital of Kinshasa, which is thought to have about 10,000 voluntary blood donors, many private facilities collect and utilize blood under totally uncontrolled and non-transparent circumstances. It was estimated in 2001 that 85% of the blood used for transfusions in the capital had not been tested. The National Blood Transfusion Policy aims to remedy this situation, and has met with some success, particularly in input coverage, which has risen from 13 to 40%.

61. Significant financing is in the offing for the DRC's HIV/AIDS program. In 2004, the Global Fund approved a grant for US\$114 million over a five-year period (US\$35 million over the first two years). The World Bank also agreed to provide US\$102 million to finance, over five years, the Multisectoral AIDS Program (MAP). The Global Fund grant will support an array of activities including health information and education, prevention (particularly for high-risk groups), assistance to infected persons, treatment of opportunistic infections and, on a more limited scale, antiretroviral treatments. The multisectoral interventions included in the MAP will be implemented by the Government, the private sector, NGOs and communities. About one fifth of this project's resources will be directly allocated to medical activities, including transfusion safety, diagnosis, and treatment of sexually transmitted diseases and opportunistic infections, voluntary testing and assistance, and the promotion and distribution of condoms.

¹⁸ A woman is deemed to have good knowledge about HIV/AIDS if she knows the three main means of prevention and can identify three erroneous notions about HIV/AIDS.

Tuberculosis control

62. A national tuberculosis control program exists, but is hampered by the inadequate coverage of primary health services. Like the vast majority of programs of the Ministry of Health, tuberculosis activities have been decentralized down to the peripheral (local) level. However, the weaknesses of the health care system in terms of primary service coverage are an important obstacle to progress in the fight against this disease. The National Tuberculosis Control Program [*Programme national de lutte contre la tuberculose*, PNLT] is now in the implementation phase of its 2001-2005 strategic plan, which aims to increase DOTS program coverage to 90%, detection rate of contagious cases to 70%, and the cure rate for smear-positive new cases to 85%. In 2002, the case detection rate was estimated at 52%, and the proportion of the population with immediate access to antitubercular drugs at about 70%. These rather high figures, provided by the PNLT, are quite surprising given the population's low level of contact with the health care system.

63. Drug shortages and inadequate human resources are major challenges. Despite the central authorities' avowed commitment to tuberculosis control, the PNLT labors under two major handicaps: the absence of an effective national system for the supply and distribution of drugs and consumables, and a lack of qualified health personnel – laboratory specialists in this instance. The expertise of laboratory technicians in tuberculosis microscopy is deemed insufficient and this shortcoming is made worse by the lack of in-service training and by the poor morale caused by low salaries. In addition, equipment (e.g., microscopes, slides, etc.) is either in short supply or absent in the vast majority of the country's laboratories.

64. It is common for health care facilities to run out of antitubercular drugs, and the quality of coverage achieved under the DOTS strategy is questionable due to the lack of continuity in the treatment of many patients of whom the system loses track. The risk of the emergence of multiple resistant strains is particularly high under such circumstances. The most recent study of resistance dates back to 1999, at which time a 5.8% rate of resistance to the usual antitubercular drugs was observed in all new and longstanding patients in the province of Kinshasa. The lack of linkages between public and private structures has diminished the effectiveness of treatment.

65. Information campaigns about this disease are conducted through the media and are aimed at spurring social mobilization and at inducing tuberculosis sufferers to enter into contact with the health system as soon as the first symptoms appear.

66. Studies conducted in Kinshasa have found that 30% of those with tuberculosis are co-infected with HIV. The integration of anti-tuberculosis and HIV/AIDS prevention activities is still at the pilot stage in the province of Kinshasa. Entities responsible for coordination of tuberculosis and HIV/AIDS prevention exist at the national and provincial levels.

67. In support of the national tuberculosis prevention strategy, the Global Fund approved in 2003 a financing program totaling US\$8 million over three years.

Prevention of childhood diseases

68. As was mentioned in the preceding chapters, vaccination coverage is still low in the DRC, and this is true for all EPI antigens: 53% for BCG; 48% for measles vaccine; 42% for Polio 3 vaccine, despite the great efforts put forth by the WHO; and 30% for DTC3. In 2001, barely 23% of children had the full series of vaccinations. (MICS2, 2001).

69. The Expanded Program on Immunization (EPI) is relatively effective, but suffers from a lack of resources, particularly at the primary care level. EPI activities are carried out using facility-based and outreach strategies. Alongside these routine activities, mass vaccination

campaigns are also conducted on the occasion of local or national 'vaccination days'. The EPI has developed a relatively efficient supply system, but the cold chain, travel problems affecting the outreach strategies, and the weak supervisory capacity of the provincial offices are among the factors cited in order to explain the disappointing performance in terms of vaccination coverage. The progress made is mainly attributable to stepped-up interventions by NGOs in certain Health Zones, and to improvements in the cold chain due to the expanded polio eradication program. The shortage of inputs required for vaccination activities seems to be caused more by a lack of funding than by inadequacies in the logistical supply chain of the health centers. Vaccination booklets, fuel for refrigerators, and vehicles are among the items that cannot be counted upon to be constantly available in the health centers and within the units charged with implementing the outreach strategy.

70. EPI objectives for the 2003-2007 period include the achievement of an 80% coverage rate (which is probably unrealistic) for all antigens, reduction of vaccine waste/loss from 35 to 10%, improvement of the safety of injections, the introduction of new antigens, improved surveillance and information systems, and the integration of other infant/child health activities (such as vitamin A supplementation and distribution of insecticide-treated mosquito nets, in particular).

71. **International support for the vaccination program has been considerable over the past few years, but the need for stable and adequate funding is still great.** In 2003, the Global Alliance for Vaccines and Immunization (GAVI) approved a grant of US\$49 million over a five-year period to support the vaccination of children. Since this financing is due to stop in 2007, the Government is still faced with a need for stable and adequate funding from local and international sources.

72. **The risk of breaks in the cold chain is high.** The supply chain operates as follows: the vaccines are removed by the Central Bureau of a Health Zone from provincial warehouses and stored in a refrigerator at the Bureau. In some Health Zones, one to three intermediate warehouses have been established in health centers. They are supplied by the Central Bureau. The other centers, which do not have refrigerators, send someone on a bicycle, with a cooler, to get the supplies over a round-trip distance that can exceed 100 km (a 2-day trip.) Vaccination sessions are then organized as soon as the vaccines arrive (under the facility-based or outreach strategies), with a system to proactively track down children who have been missed. This set-up makes it difficult to have vaccination available on an ongoing basis, especially since, in some Health Zone bureaus and relay centers, the refrigerators are only turned on 15 days per month due to a lack of fuel. It is therefore difficult to organize more than one fixed-location vaccination day per month, and to cover the entire health care zone under the outreach strategy (Révillion, 2005).

73. **DRC adopted in 2001 the strategy of Integrated Management of Childhood Illness (IMCI) and is now in the initial implementation phase.** An array of interventions at the level of health care facilities, communities, and households is carried out in this connection using facility-based and outreach strategies – prevention of malaria, diarrhea, malnutrition, and acute respiratory infections (ARI). The national nutrition program is part of this framework. The success of this strategy is compromised by the system's lack of human resources and low quality care, and the failure to promote healthy behaviors within households. A survey conducted in Health Zones receiving support under a World Bank project revealed that although over 70% of mothers recognize a high fever as a red flag, barely 2% of them react to convulsions, severe diarrhea, or coughing in their children.

Maternal health

74. **A reproductive health program is in place but lacks the funds needed to operate properly.** DRC established in 1998 a National Reproductive Health Program [*Programme*

nationale de la santé de la reproduction, PNSR] which attaches top priority to the prevention of maternal mortality. Its main objectives are to improve access to good quality health care and to improve the status of women in DRC. The PNSR defines a minimum package of activities for each category of health care establishment, as well as procedures to be followed in providing care at the various levels in the health care pyramid. Unfortunately, and as is the case with most specialized programs of the Ministry of Health, the PNSR lacks the financial and material resources needed for its implementation. As was noted in a previous chapter, maternal mortality is excessive in the DRC although the prenatal consultation rate is relatively high. Access to good quality reproductive care and services, and particularly emergency obstetrical care, is generally inadequate. Family planning services are not widely available (in 2001, only 4.4% of women aged 15 to 49 were using a modern method of contraception).

10. Government strategy

75. Since 2001, the Government has made a considerable effort to develop policies and strategies in the sector, emphasizing primary health care and specialized programs. As was mentioned previously, the Government's strategy in the sector has focused essentially on the development of Health Zones. The national health policy adopted in 2001 reaffirms the strategy of providing an array of essential health services through the Health Zones. The number of Health Zones has been increased in order to create the administrative framework for expansion of the care network to improve the geographic accessibility of services. In 2002, operating standards for the Health Zones and the content of the activity packages were defined. The policy of 2001 also affirms the decentralization of the system, and particularly the autonomy of the Health Zones. This new policy has been accompanied by a Government commitment to dealing with issues related to human, financial, and material resources. More specifically, the document sets out the Government's pledge to allocate 15-20% of the total budget to the health sector.

76. As a reflection of the vertical structure of the Ministry of Health, the new policy sets out the general objectives of a large number of specialized programs. Also in 2001, new strategies emerged from the main specialized programs, and particularly EPI, and the malaria and tuberculosis control programs.

77. Recent policy development has continued to emphasize two main objectives – i.e., the development of the Health Zones and the control of priority diseases – while at the same time reflecting a better understanding of the demand factors, and particularly financial barriers, that affect service utilization. The Government's draft *Poverty Reduction Strategy Paper (PRSP)* for 2002 conforms to the preceding policy orientations, as it stresses the development of basic health services by means of the Health Zones and support for specialized programs, and especially those dealing with HIV/AIDS, malaria, and tuberculosis. This strategy also includes a Government pledge to increase the sector's budget to 15% of the total budget. The health component of the Government's 2004 Minimum Partnership Program for Transition and Recovery [*Programme minimum de partenariat pour la transition et la relance*, PMPTR] likewise has as its general goal the revitalization of the health care system in order to improve progress towards the MDGs, and as its specific goals the development of the Health Zones and strengthening of institutional capacities at all levels.

78. A new financing strategy for the health sector, drawn up in 2004, reflects in particular the Government's willingness to address the major problem of financial barriers to service utilization, as well as its intention to decentralize and improve financial management.

Chapter 4: Financing the Health Sector

1. The DRC health system derives its funding from various sources, including private enterprises, the State budget, donors, and household contributions. The State budget steadily declined prior to 2002 and now scarcely suffices to cover the low salaries of health care personnel. As a result, the health care costs for households have steadily increased in order to offset the State's disengagement. Investment in the sector, which was particularly low during the decade of conflict, is essentially covered by external aid. The immediate impact of this imbalance in sector funding sources is the creation of financial barriers limiting access to care for much of the population.

2. **A partnership between the Government, donors, and users of health care, in order to ensure the sector's financing, was an essential ingredient in the Health Zone reform of the 1980s.** After some pilot studies, Zaïre began in 1982 to develop the Health Zone system. The financing strategy for the Zones was based on partnership: donor assistance for investment costs, payment of health worker salaries and operating costs of central and intermediate structures by the Government, and eventual self-financing for operating expenses at the peripheral level. The need to cover operating costs – apart from drugs – forced the Zones to establish cost-recovery mechanisms. Positive results were obtained and by 1987, 220 of the 306 Zones were deemed to be operational. However, most Zones indicated that they had trouble covering all operating costs.

3. **This partnership collapsed in the 1990s following the cessation of development cooperation and the Government's considerable reduction in health expenditures, leaving households with the entire burden of financing the sector.** In the early 1990s, external aid for the health sector, which had been covering the system's investment costs and helping Health Zones with their self-financing difficulties, diminished sharply due to international sanctions against Zaïre. Only a few donors continued to provide sporadic aid through NGOs and churches in order to maintain a minimal level of activity in the sector. At the same time, the health system saw its State support dwindle over the years.

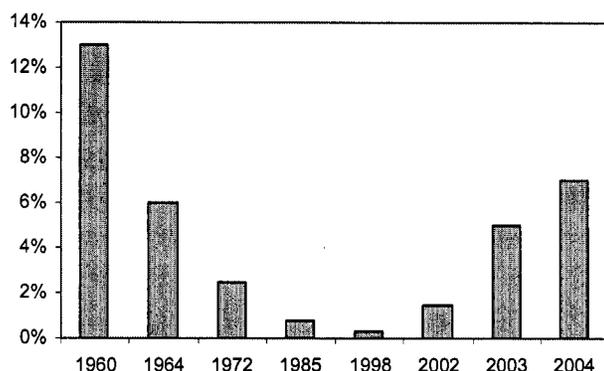
1. Public health expenditures

4. **As of 2004, the total State budget was small but growing.** The public finance crisis existing since the early 1980s was characterized by: i) a drop in State revenues, to only 5% of GDP; ii) a growing budget deficit; and iii) an increase in salary-related operating costs, to the detriment of non-salary operating costs and investment. Since 2001, however, State expenditures have been growing at a faster pace than GDP growth, reaching 19% of GDP by 2003. In addition, the DRC became eligible for the HIPC Initiative in July 2003.¹⁹ The funds thus freed up are intended to finance "pro-poor" expenditures, of which the health sector is one of the most important.²⁰

¹⁹ Under the HIPC Initiative, the DRC obtains debt relief estimated at US\$76 million in 2004, of which 20% was allocated to the health sector (although the execution rate was low, with most funds budgeted for the rehabilitation of the large national hospitals.). The same percentage is anticipated for the 2005 budget. The 2004 remainder will be carried over into the 2005 budget, which suggests that as of 2005 the budget allocation for the health sector could increase considerably, raising the issues of equity and efficiency of allocation.

²⁰ After 2007, if the DRC reaches the completion point, the proceeds from debt relief will no longer be reserved for the social sectors.

Figure 24. Share of the health budget in the total government budget



Sources : Ministry of Health and Health Roundtables, Kinshasa, May 2004.

5. Budget allocations to the health sector have increased considerably over the past few years. The budget allocation of the Ministry of Health, which was US\$3 million in 2001 (or US\$0.05 per capita), was about US\$13.5 million in 2002,²¹ or about 1.5% of the total State budget. By 2003, this share (under a budget drawn up in November 2003) was 5.3%, corresponding to 17 billion Congolese francs or US\$44 million and 0.8% of GDP. This amount doubled in 2004, reaching 35.2 billion Congolese francs (of which 8.8 billion Congolese francs were freed up under the HIPC Initiative), or US\$87 million – US\$1.40/capita. This allocation represents an increase relative to the 1990s (see Figure 24), but is still far from the goal of 15% set out by the Government in the interim Poverty Reduction Strategy Paper (PRSP-I).

Table 26. Projected government budget allocations to the health sector, DRC

	2003	2004	2005	2006	2007
GDP (in US\$ millions)	5 580.6	5 932.2	6 347.5	6 791.8	7 267.2
Real GDP growth (%)	5.6	6.3	7.0	7.0	7.0
Total government budget (as % of GDP)	13.6	19.3	25.3	21.6	21.4
Total government budget (in US\$ millions)	759.0	1 144.9	1 605.9	1 467.0	1 555.2
% of budget allocated to health	5.3	7.1	8.0	9.0	10.0
Health budget (in US\$ millions)	40.2	81.3	128.5	132.0	155.5

Source : Authors, based on IMF projections (2004).

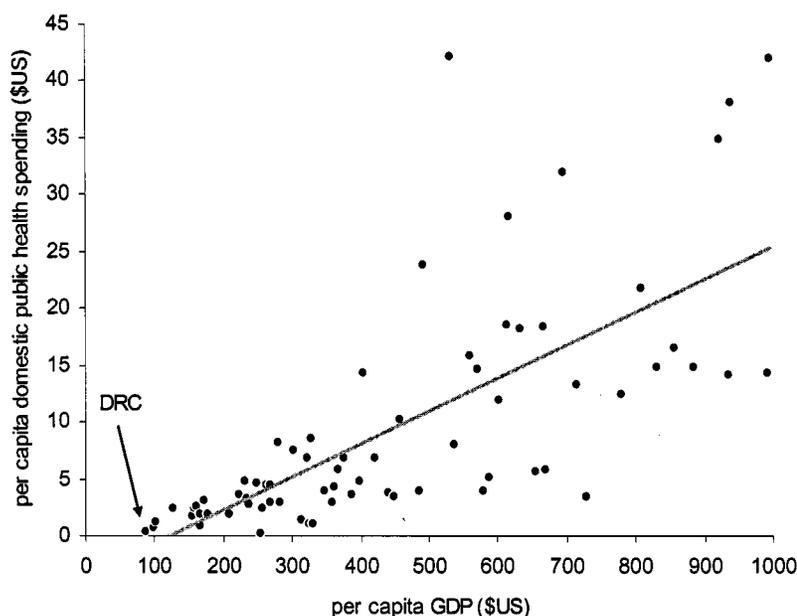
6. The government health budget could theoretically reach US\$155 million, or US\$2.70/capita/year, by 2007. The macroeconomic objective for the 2004-2007 period is GDP growth of 6.8% per year (IMF, 2004). The Government is committed to increasing the health sector's share of the total budget to 15%. Assuming that the share of expenditures allocated to the sector increases gradually, reaching 10% by the end of the period, the sector allocation could reach US\$155 million by 2007 (Table 26). These projections must be tempered, however, given the government's record with regard to budget execution, particularly in the health sector.

7. Due to the low budget execution rate, government expenditures in the sector diverge widely from the allocated budget; actual per capita expenditure in 2004 was thus only US\$ 0.40. Allocations are executed partially and sporadically, and are not always accounted for. In 2002, 55% of the sector budget (US\$8 million) was executed. By the midpoint of 2004, less than 30% of the 2004 budget had been executed. In 2004, the Government of the DRC actually spent less than US\$0.40 per capita, i.e., less than 0.5% of its GDP. Figure 25 shows that the level of

²¹ 4.6 billion Congolese francs in 2002.

domestic public expenditures on health is one of the lowest in the world, consistent with the fact that DRC has one of the world's lowest per capita incomes. Achieving the goal of US\$ 2.50 per capita, as estimated in Table 26, would put the DRC at a level comparable to that of countries with average per capita incomes at least twice as large.

Figure 25. Domestic public expenditure for health and GDP per capita (countries with GDP/capita < US\$1,000)



Source: Authors, based on WHO and World Bank data.

8. Available data on public expenditures in 2002 indicate the scope of the budgetary pressure at that time. According to information on non-salary operating expenditures provided by the Ministry of Health, only US\$0.50 per capita had been budgeted and US\$ 0.25 executed. It would seem logical that this level of expenditure would have a devastating impact on the functioning of services and on institutional capacity. The situation has apparently improved since then, but there are no data available to confirm this. Whatever the case may be, this corroborates the belief that the projections set out in Table 26 should be considered a desirable goal, but one that can only be achieved if significant progress is made in budget execution, financial management, and absorptive capacity.

9. **Units within the Ministry of Health are uninterested in the budgetary process, preferring to focus on external aid.** The departments do not know how much funding is allocated to them, do not try to pursue budget execution, and are not interested in the preparation of budgets from one year to the next. This situation leads to a fragmentation of effort in the sector, and encourages non-execution, as was observed with HIPC funds allocated to the sector in 2004.

10. **Although salaries are the largest component of the government budget in the sector and have the highest execution rate, average salaries of health personnel are very low in absolute terms.** In 2002, the government health budget was distributed as follows among the expenditure categories: 62% for salaries, 14% for non-salary operating costs, 13% for investment expenditures, and 10% for ancillary budgets. A budget for the purchase of drugs has been non-existent since 1980. It is not possible to obtain reliable figures on budget execution by expenditure category. It would appear, however, that execution rates are about 70% for salaries and about 40% for non-personnel current expenditures. No information is available on budget

execution for joint expenditures and ancillary budgets; in 2001, no investment credits appear to have been executed in the health sector.

11. Average salaries in the health sector have steadily deteriorated over time. Indeed, the 'salaries' budget item accounted for only US\$9 million in 2002 and US\$6 million in 2003.²² This amount, which represents an average monthly salary of US\$14, makes it impossible to pay sector employees an appropriate salary or to promote employees. The inadequacy of the amount is also causing arrears to accumulate. The Ministry of Health indicates that monthly salaries paid by the State are about US\$15 to US\$20 for a Chief Physician in a Health Zone and less than US\$50 for a Provincial Medical Inspector, while a nurse in a health center is paid US\$10 to US\$.²³

Table 27. Health sector budget by province, DRC, 2002 (US\$ '000, unless otherwise indicated.)

Province	Main budget (salaries)	Ancillary budgets (salaries)	Ancillary budgets (operating)	Total budget	Total budget per capita (US\$)
Bas-Congo	295	3	44	342	0.09
Equateur	553	23	44	620	0.10
Bandundu	552	0	4	556	0.08
Kinshasa	5 172	401	989	6 562	0.89
Kasai Occidental	346	54	44	446	0.10
Kasai Oriental	621	0	4	625	0.11
Katanga	589	0	151	740	0.17
Total	8 128	482	1 282	9 893	0.26

No figures are available for the provinces of Nord-Kivu, Sud-Kivu, Maniema, and Orientale.
Source: Ministry of Finance (2002).

12. **The geographic distribution of the budget clearly favors Kinshasa.** Data regarding the health sector budget for 2002 indicate that US\$0.10-0.20 per capita are allocated to the provinces, compared to US\$ 1 per capita for the city of Kinshasa (Table 27). As for actual expenditures, 60% of the salary amount (executed budget) is spent in Kinshasa (main towns and city), while 35% is spent on provincial personnel and 5% on personnel included under the Ancillary Budgets. This is explained to a great extent by the uneven distribution of physicians within the country. Another explanatory factor may be a certain amount of growth within the central Ministry, where the number of directorates went from 6 to 11 between 1998 and 2004, and the number of specialized programs rose from 8 to 52.

13. **Budget allocation clearly favors the central level of the Ministry.** It is difficult to determine, on the basis of available information, the distribution by administrative entity. It seems clear, however, that the intermediate level is not formally represented in recurrent expenditures, and that 44% of this budget was allocated in 2002 to the central Ministry and to its subordinated administrative units.

14. **The Ministry's intermediate levels receive no operating allowances from the Government, with the result that there are 'negative transfers' from health care facilities and their users.** Indeed, the absence of operating allocations in the budget for provincial departments makes it impossible to finance the decentralized administration of the sector. Thus, the burden of financing the operations of Provincial Health Inspectorates, provincial antennae of

²² No explanation is readily available for this decrease.

²³ Soeters (2003) puts a desirable monthly salary for a Chief Physician in a Health Zone at US\$100 – 200, and that of a nurse at US\$50 – 60.

programs and directorates, and District Inspectorates, is borne through the taxation of health services by these levels.

2. Financing by public and private enterprises

15. The financing of health services by enterprises, and particularly by public and parastatal enterprises, was widespread in the 1980s. A 1986 study indicated that, for the 7.2 million inhabitants that they were covering, enterprises had spent US\$144 million for health care, or US\$20 per person. In 1989, the contribution of enterprises to the financing of the sector was estimated at US\$142 million, covering about 27% of the population (Ministère de la Santé, 1999b). The role of enterprises in the mining sector, most of which are public, was crucial (they accounted for 25% of GDP, 25% of government revenues, 75% of the country's exports, and 7% of formal-sector jobs.) The roughly one hundred public enterprises²⁴ often had their own medical facilities, and sometimes even large hospitals. Private enterprises more often entered into service contracts with medical facilities and paid directly for care provided to their employees and their families.

16. This contribution from public and private enterprises disappeared over the last decade and may resume with some difficulty. The bankruptcy of the public enterprises, which experienced production drops of 50-80%, caused their contribution to sector financing to disappear. The tax authorities estimated in 2003 that only 600 enterprises had a turnover exceeding US\$100,000. A 2004 survey found that only 2.6% of respondents seeking care had their medical expenses paid by their employers (Ministry of Health, 2004). Another recent study put the figure at 4.1% (BERCI, 2004).

3. External aid to the health sector

17. External aid to the health sector is growing and accounts for more sector financing than the government. This aid, estimated at US\$95 million in 1989, had become marginal in the 1990s due to donor withdrawal. With the resumption of the peace process since 2001, external aid to DRC – both humanitarian and development aid – has steadily increased. This support to the health sector, which was estimated in 2001 at US\$137 million and in 2004 and 2005 at US\$150 million, could reach US\$210 million per year (US\$3.60/capita) over the next few years.²⁵

18. A large share of external aid is in the form of integrated assistance to the Health Zones, and is often implemented by NGOs. According to the Ministry of Health, about 60% of aid is in the form of “global support” for implementation of the Minimum Package of Activities (MPA) through intermediate financing entities, most of which are NGOs. In 2004, this support covered 60% of the 515 Health Zones and emphasized expansion of the supply of primary health care services.²⁶ The annual amount of this support per Health Zone is highly variable, ranging from US\$70,000 to 500,000. Moreover, some donors provide direct support to the Ministry's central and intermediate levels, and particularly to vertical programs.

²⁴ Including, for example, Gécamines, Petrocongo (Cohydro), Onatra and SNCC.

²⁵ This combined humanitarian and development aid amount calculated by the authors assumes an annual contribution of about US\$45 million from three World Bank-financed projects; US\$33 million from the Global Fund; US\$20 million from the European Union; US\$20 million from USAID; US\$10 million from the Belgian Cooperation; US\$8 million from the African Development Bank (AfDB); US\$37 million from United Nations agencies; US\$25 million from ECHO; and about US\$12 million from other donors.

²⁶ This figure could reach 72% in 2005 with upcoming World Bank- and European Union-financed projects.

19. Humanitarian aid to the sector consists mainly of direct support to Health Zones in regions affected by the conflict, and emphasizes an improvement of the quality of supply, along with a reduction of financial barriers. Humanitarian aid is channeled through international NGOs and United Nations agencies. In order to improve quality of services and their affordability, humanitarian programs direct their support to the provision of essential drugs, payment of health care personnel, and the regulation of consultation fees.

Box 4. Using contractual approaches

A first level of contracting with implementing agencies for supporting Health Zones. Most donors choose to channel their funds through NGOs, religious organizations, and implementing agencies established in DRC. This is justified by the normative and coordinating role assumed by the Ministry of Health, by the latter's weak absorptive and management capacity, and by the need to ensure rapid implementation of funds. The Ministry supports this implementation mechanism and is considering, over the longer term, the creation of a "Health Fund" that would be comprised of capital from the Government and aid from donors, who would use the same financing path under the direct coordination of the Ministry. The implementing agencies usually take a percentage of project costs to cover their administrative expenses. Thus, under the World Bank-financed EMRRP project, US\$42 million in aid over three years to 67 Health Zones was implemented by eight agencies under contracts for amounts ranging from US\$2 million to US\$7 million.

A second level of contracting with service providers and health staff to support health care provision. Given the low salaries paid by the State and the large financial obstacles to the utilization of health services, DRC has been experimenting for the past few years with paying incentives (under performance-based contracts) to public service providers (and to a lesser extent to professionals at the intermediate level of the Ministry). The payment of incentives, often by the intermediate agency that is implementing donor aid, is aimed at improving the quantity and quality of services rendered and, indirectly, at reducing service fee scales and thus increasing access to care for the poorest population segments. The terms of these performance contracts may stipulate, for example, the provision of free care to indigent patients.

Indeed, the reduction of providers' reliance on self-financing to supplement staff salaries and the operation of health care facilities, and the elimination of intermediate-level levies through inspection taxes, as specified in such contracts, should ease pressures on service fees, mobilize resources, and lead to expanded treatment for the poor.

The Ministry of Health has issued some partnership guidelines that represent an attempt to establish some standards in this area. However, Ministry employees are still relatively uninvolved in contract management. Each implementing agency (NGO) seems to have developed its own type of contract and procedures for its implementation.

20. Development aid is divided between support to Health Zones and to the various levels of the Ministry, and primarily targets improvements in service supply. A substantial portion of development aid (about 50%) consists of investment in infrastructure, equipment, and materiel. It also supports administrative structures (e.g., Central Bureaus of Health Zones, Provincial Medical Inspectors, etc.), technical and medical training institutes, and Regional Distribution Centers (RDCs). This aid often includes incentives for personnel and subsidies for essential drugs.

21. Within this context, the Ministry of Health confines itself to a strategic, normative, and coordinating role, and does not directly implement donor-financed projects. In its declaration following the May 2004 Health Roundtable, the Ministry expressed its desire to "harmonize [donor support], particularly in terms of the policy on personnel payment, performance contracts, drug supply, and the subsidization of short-term care." An assumption of these responsibilities by the Ministry, particularly in the areas of cost recovery, pharmaceuticals, and the coordination of a variety of intermediate implementing agencies, is crucial in this context.

22. **The question of the sustainability of donor interventions is not raised**, due to the common understanding that the State and households will be unable, for the foreseeable future, to shoulder the burden of financing adequate health services in DRC.

4. Financing by households

23. **Partial cost recovery through user fees has long been a source of financing of health care services in the DRC.** In the 1980s, the sale of drugs and a system of consultation fees, based on the Bamako Initiative, were introduced at the same time that the country was organized into Health Zones. These changes were accompanied by donor-financed investments in infrastructure and in improved quality of care. It was an era of structural adjustment programs involving budgetary restrictions and a quest for stable and sustainable financing on the part of donors. The strategy at that time, which was promoted in particular by the World Bank, consisted of encouraging an increase in consultation fees in order to support quality improvements, while at the same time developing exemption schemes to prevent the poorest from reducing their utilization of services. In Sub-Saharan Africa, despite the existence of a few documented experiments in which higher consultation fees, offset by improved quality, have led to increased utilization of services, the cost-recovery experience usually resulted in recovery on a low proportion of costs, dysfunctional exemption systems, and low utilization of services.

24. **In the DRC in the 1990s, households became practically the only source of financing for health care services**, due to the nearly total cessation of all international aid and the reduction of public expenditure in the sector. The lack of a government budget for personnel payments and the absence of international support for investment led inevitably to a considerable drop in service utilization. Per capita utilization rates for curative care observed after donors' withdrawal were about 0.15 or less, compared to rates of about 0.6 observed in the 1980s. Health care services deteriorated, but the meager financing derived from users' payments and sporadic donor assistance enabled the system to continue functioning at a low level.

Table 28. Proportion of cases not receiving care, total and for financial reasons, DRC

	(% of cases)		
	Did not seek/ receive care	Did not receive care for financial reasons	Source
Basankusu (Equateur)	36	29	MSF (2001)
Lisala (Equateur)	24	19	"
Kilwa (Katanga)	28	23	"
Kimpangu (Bas-Congo)	20	10	"
Inongo (Bandundu)	22	18	"
Nord-Kivu	19	15	Soeters (2003)
Kasai-Oriental	16	7	PSF (2003)
9 provinces	23	19	BERCI (2004)*

* Refers to prenatal consultations; the sample was drawn from target populations of health care facilities.

25. **The financial barrier excludes a large proportion of the population.** Various studies have shown that the proportion of sick people who either do not seek or do not receive care varies considerably, but may be as high as 50% (Table 28 and Table 29). For example, the 2001 MICS2 indicated that 40% of children with symptoms of acute respiratory infection had not been seen by a medical provider. In all studies in which this was measured, inability to pay was the major reason, with the percentage of cases excluded by financial barriers ranging from 7 to 30% (Table

28). For example, in a sample of populations living close to health facilities in nine provinces in 2004, 19% of households indicated that pregnant women lacked access to prenatal care due to its prohibitive cost (BERCI, 2004).

26. In addition, a large proportion of the sick resort to self-medication. The proportion of the population resorting to self-medication, i.e., who use private pharmacies and medicines obtained 'on the street', is estimated by various surveys at 20-40% (Table 29). Thus, the MICS2 showed that about 14% of children with symptoms of acute respiratory infection had received medication from private pharmacy or medicine seller, while 10% had been treated only by relatives or friends. A study in Nord-Kivu likewise determined that 38% of individuals ill during the preceding month had consulted private pharmacies and medicine sellers. This study also estimated that the poorest half of the population was more likely to use this type of treatment (Soeters, 2003). These surveys indicate that in the event of illness, the proportion of the population lacking contact with a formal-sector health professional is around 50%.

27. Some studies have also demonstrated the financial constraints facing those who do contact health care facilities. One study in Maniema indicated that 6% of cases that received treatment were obliged to abandon the course of treatment due to its cost (Poletti, 2003). The survey in Nord-Kivu (Soeters, 2003) determined that 25% of patients who had consulted a formal-sector health professional had not continued the treatment (although the reasons were not investigated).

Table 29. Proportion of cases using self-medication and proportion that did not receive care, DRC

	(% of cases)		Source
	Self-medication*	Did not seek/receive care	
Nord-Kivu	38	19	Soeters (2003)
Kasai-Oriental	25	16	PSF (2003)
5 provinces	40	21	ESP (2003)
9 provinces	..	38	BERCI (2004)
Bandundu	19	40	MICS2 (2001)
Bas-Congo	21	50	"
Equateur	29	45	"
Kasai-Occidental	18	44	"
Kasai-Oriental	26	50	"
Katanga	24	47	"
Kinshasa	6	38	"
Maniema	28	21	"
Nord-Kivu	38	27	"
Province-Orientale	25	42	"
Sud-Kivu	19	53	"
Country as a whole	24	44	"

* Care sought from pharmacy, medicine seller, family, neighbor, or other.

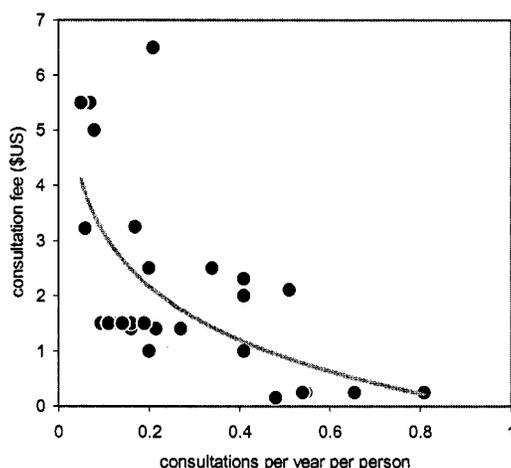
28. The price elasticity of health care demand, although rarely measured, appears to be significant and greater for the poorest. There are a number of documented cases in the DRC in which it was determined that a reduction in consultation fees led to an increase in service utilization, or that increased fees had a negative impact on frequency of consultation. A substantial drop in service utilization was seen particularly clearly when consultation fees increased suddenly in the 1980s (Bethune *et al.*, 1989). A prospective study from 1987 to 1991 in

a Health Zone in the province of Bandundu observed a drop in service utilization of up to 40% when consultation fees were introduced, with an improvement in quality that did not offset the impact of the introduction of fees (Haddad and Fournier, 1995). A program implemented by an NGO in 2002 began with a per capita service utilization rate as low as 0.18 for curative care; this rate rose to 0.44 and then to 0.65 as consultation fees decreased (Poletti, 2003).

29. A 2005 study comparing data obtained from 26 Health Zones receiving NGO support clearly demonstrated the relationship between the cost of care and the rate of service utilization. Indeed, it would appear that the cost of a consultation must drop below US\$1 in order to obtain service utilization rates exceeding 0.5 consultations per capita per year (Figure 26). The improvement in quality due to external intervention must, of course, also be taken into account as another factor in increased utilization.

30. **There are no reliable data in the DRC on household health expenditures or on total health care expenditures.**²⁷ The World Bank estimated in 1980 that annual per capita health care expenditures were about US\$5.60. The 2003 study in Nord-Kivu estimated per capital health expenditures at US\$6.50 (Soeters, 2003). These estimates, as well as the prices for various health care services (Table 30) may be compared to per capita GDP, which is estimated at less than US\$100.

Figure 26. Rate of utilization of curative services as a function of average cost per episode, DRC, 2005 (n = 26)



Source : Révillion (2005).

31. **However, it seems obvious that health care expenditures weigh heavily on household budgets, particularly for the poorest.** Given the level of poverty in the DRC, one can deduce that health care costs represent a considerable burden for households. A study conducted by an NGO in Maniema in 2001 determined that 30% of patients had been obliged to sell some belongings to cover their medical costs, whereas 15% had had to borrow money (Poletti, 2003). As for the Nord-Kivu study, it determined that 24% of patients had been forced to sell some possessions to pay their medical bills, whereas 12% had gone into debt, and 6% had borrowed money from their families (Soeters, 2003). The recent study of populations living near health facilities determined that 35% of patients who had received care had been unable to pay their entire bill (BERCI, 2004). The impoverishing effect on households of out-of-pocket payments

²⁷ A number of ad hoc studies have, however, estimated the cost per incident of illness at US\$1 to 5.50, and the average number of episodes of illness per person at 3. Assuming that 60% of illness episodes are treated and that the average cost per episode is US\$3, annual per capita expenditure would be US\$5.40.

may manifest itself in a reduction of capital, an accumulation of debt, and a diversion of resources away from productive activities.

Table 30. Examples of fees observed for health services, DRC

	Amounts noted (US\$)
Episode of malaria	3.8 (of which medicine = 0.53)
Episode of diarrhea	4.7 (of which medicine = 0.6)
Birth at a Health Center	3 - 10
Birth at General Referral Hospital	5 - 15
Surgical intervention	5 - 45
Caesarian section	10 - 125

Source: Fees recorded in various studies cited.

32. On the other hand, revenues derived from users' payments have made it possible to maintain a minimum level of health care. Experience in Sub-Saharan Africa has shown that the cost recovery system covers between 5 and 10% of the total cost of primary care, but might manage to cover the cost of drugs. A study in Zaire in the 1980s determined that users' payments covered 97% of non-salary operating costs (most of which were drug costs) (Poletti, 2003). However, salaries in the DRC have not been high enough or paid consistently enough over the last decade, with the result that health personnel remuneration has to be covered by fees for care and in the resale cost of drugs. Even though these payments have helped maintain the health care system at a minimal level, it seems that only an improvement in public financing (out of internal and external resources), covering at least adequate salaries for health care personnel, can improve quality and boost utilization rates.

33. There are numerous fee-setting systems. In the Health Zones supported by NGOs, the fee scale is either set by health committees, generally on a per-intervention basis (a profit margin on the sale of drugs is set in that case by the NGO), or fees are set by the NGO under its project and imposed by it. In the area of fee-setting, there are two options: i) one fee per episode, which covers all interventions and drugs prescribed for the same consultation; and ii) fee for service, by which all interventions and prescriptions are billed separately. Fees per episode have the advantage of streamlining prescriptions and billing, while creating a sort of pooling of risk. The disadvantages have to do with financial risks associated with over-prescription or, conversely, of rationing of prescriptions in order to boost profit margins. This system also requires constant availability of drugs and rigorous monitoring of their consumption. Fees for each service ensure financial viability, essentially with regard to drugs. However, this method may also foster over-prescription, since revenues are no longer proportional to the number of patients seen, but instead to the number of interventions performed and prescriptions issued per patient. Moreover, it does not encourage continuity of care, since patients cannot always pay for the entire course of their prescriptions.

34. Financial management is at best informal, exemption schemes function poorly, and the collection of consultation fees has led to abuses. Indeed, budgets and financial management seem to be nonexistent at the level of health facilities. A recent study of 56 health centers showed that none of the facilities surveyed had an official budget (BERCI, 2004).

35. The exemption policies in place are supposed to ensure access for those who are designated as indigent by the local administration. However, only an infinitesimal portion of the population seems to be benefiting from these exemptions. A survey of target populations of health care facilities in nine provinces (n = 2 880) indicates that only 1.4% of patients possess a "benefit entitlement" or "indigence" card enabling their bills to be covered by the State (BERCI, 2004). The local administration is supposed to reimburse the Health Zones directly for care provided to

indigents, but this rarely happens. In fact, the exemptions enjoyed by civil servants and military personnel represent a greater proportion than those benefiting the indigent. In addition, the administration's failure to reimburse for the cost of care for civil servants and soldiers weighs more heavily on the revenues of health facilities and Health Zones (Maltheser, 2004). This forces health care facilities to further increase fees, a strategy that makes these exemptions an indirect and regressive tax.

36. One example of the perverse effect of this situation, in which the poorest bear most of the financial burden of financing health care services, is the practice of obliging patients who have received care to remain in the facility until their families have paid the bills. This practice seems to be particularly common in the area of emergency obstetrical care, since the high price of a Caesarian section is unaffordable for most people. Empirical evidence is supplied by the study of target populations of health care facilities in nine provinces, in which 28% of respondents said that health care facilities imprisoned patients if the family did not pay the fees (BERCI, 2004).

37. The numerous experiments with community-based health insurance schemes that protect households from potentially catastrophic health care expenditures should be explored. The most extensive and most thoroughly studied is the mutual of Bwamanda (province of Equateur), which insures its 114,000 members for hospital care. There are also many different arrangements involving small groups that protect themselves against the risk of catastrophic expenditure. These arrangements are small-scale; a 2004 study of nine provinces found that 2.4% of households had their health care costs covered by a mutual (BERCI, 2004). It should be noted that such programs are not easily reproduced and do not necessarily benefit the poorest. In Bwamanda, for example, although hospitalization is greater among the insured than in the rest of the population, the poorest remain the least likely to be insured (Criel *et al.*, 1999). The failure of at least one pilot community insurance scheme, which was supported by external aid, has been studied in Masisi, Nord-Kivu. The reasons for its failure included weak design (leading to overconsumption of services), and the lack of a feeling of ownership on the part of those who were insured (Noterman *et al.*, 1995). Insurance mutuals—and any other form of community-based insurance—cannot improve the overall situation unless public expenditure in the sector increases, but they are a potential way of reducing risks and of improving equity at the household level.

38. Economic barriers to access, and the burden on households, can be reduced by a considerable increase in public expenditure and external aid to the sector. The population of DRC is too poor to be able to finance the sector alone. Reducing the financial barriers to care and the impoverishing effects of health care expenditures on households will require a higher level of public expenditure. Although the government budget has grown over the past few years, the increase remains illusory to the extent that only a small part of it is executed: an estimated US\$24 million in 2004, or US\$0.40 per capita. External aid has increased considerably, and projections for the coming years are for about US\$150 million or US\$3.60 per capita per year.

39. Additional support to the sector should be accompanied by specific measures aimed at reducing direct payments by users. In any scenario, it is certain that a portion of the financing requirement will continue to be covered by user fees. The increase in public expenditure and external aid must be accompanied by measures aimed at improving exemption systems in order to protect the poorest households in particular from the impoverishing effects of health care costs. On the supply side, at the level of the health care facilities and Health Zones, these initiatives may include better management and accounting, financial transparency, proper allocation of user fees in order to enhance quality, and more efficient exemption systems. Such measures could only have an impact if public expenditure is increased, particularly in terms of salaries and the reimbursement of costs generated by fee-exempt patients.

40. Achievement of the MDGs will require a much greater effort, but the financing gap is not insurmountable in the short term. Estimates of the cost of achieving the MDGs by 2015 in other Sub-Saharan African countries vary considerably. The United Nations Millennium Project estimates the annual requirement for Ghana, Tanzania, and Uganda at US\$16 to US\$23, reaching US\$30 to US\$44 by 2015. A joint estimate by the Government of Ethiopia and the World Bank puts the annual marginal cost (ie. Additional to what is currently spent) at around US\$6, rising to US\$15 by 2015.

41. In the absence of data specific to DRC, and assuming that the country's additional requirements could be equivalent to those estimated for Ethiopia, the annual public financing requirement over the next few years would be about US\$6 per capita. If one estimates that projected public expenditures in the sector could reach US\$4 per capita annually over the next few years, one arrives at a financing deficit of US\$2 per capita, for an annual total of US\$120 million. This does not appear insurmountable, and a substantial portion could be covered by the government if GNP growth projections and government health expenditure targets, as set out in Table 26, are achieved.

42. On the other hand, a more ambitious program to achieve the MDGs will cost between US\$16 and US\$23 per capita over the next few years, according to estimates provided by the United Nations Millennium Project. In that case, the annual gap would amount to US\$12 per capita or more.

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