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ARMENIA HEALTH SYSTEM PERFORMANCE ASSESSMENT

2009

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ABSTRACT

This report summarizes the main findings of an assessment of the performance of the Armenian health system, which was carried out by the Ministry of Health of Armenia, with the technical and financial support from the WHO Regional Office for Europe and from the World Bank. This assessment was carried out in 2008 and 2009 and contributes to the efforts pursued by the government of Armenia to strengthen the capacities of the Ministry of Health for effective stewardship of the health system.

This report presents an assessment of the performance of the health system against a number of key performance dimensions: health system stewardship, health management information system, development of health human resources, equity in financing and financial protection, health system efficiency, access to health care services, quality and safety of health care services, risk factors, health promotion and disease prevention, health system responsiveness, and improvement in health status. Policy recommendations are presented at the end of each section of this report. An executive summary is enclosed. This health system performance assessment is the first in a series of similar reports released this year by the World Health Organization Regional Office for Europe. Other reports to be released in 2009 include Georgia, Estonia and Portugal.

Keywords

OUTCOMES AND PROCESS ASSESSMENT (HEALTH CARE)
HEALTH SYSTEMS PLANS – organization and administration
PUBLIC HEALTH – organization and administration
HEALTH STATUS
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ABBREVIATIONS

ADHS	Armenia Demographic and Health Survey
AIDS	acquired immunodeficiency syndrome
AMD	dram *(€1≅570 drams)*
CHeSS	Country Health System Surveillance
GDP	gross domestic product
GPS	Global Positioning System
HFA-DB	European Health for All Database
HIV	human immunodeficiency virus
HMN	Health Metrics Network
HSPA	health system performance assessment
ICD-10	*International statistical classification of diseases and related health problems*, 10th revision
MDGs	Millennium Development Goals
MDR-TB	multidrug-resistant tuberculosis
NGO	nongovernmental organization
NHA	National Health Accounts
NHIAC	National Health Information Analytical Centre
NSS	National Statistical Service
SAM	Service Availability Mapping
TB	Tuberculosis
WHO	World Health Organization
WHR	World Health Report

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FOREWORD

The Ministry of health of the Republic of Armenia is committed to improving the health of Armenians and their access to quality health care services. In recent years, the government of Armenia has invested increasingly in health, has prioritized the implementation of primary health care reforms and an optimization of the hospital network in the country, and is targeting the achievement of Millennium Development Goals by 2015. These commitments are consistent with the endorsement by the government of the WHO Tallinn Charter: Health Systems, Health and Wealth in 2008.

In 2007, the Ministry of Health, jointly with the WHO Regional Office for Europe and the World Bank, released a first Health System Performance Assessment Report which focused on our key strategic priorities at that time: reforming the primary health care sector; optimizing the hospital network in marzes; and improving maternal and child health services. At the same time, the Ministry, with the support of the same partners, released a Report on National Health Accounts in Armenia. It is fundamental that we understand not only how the health system performs, but also the value we get out of the public funding invested in health. This is why I think that this assessment of the performance of our health system and national health accounts should come together. Altogether, this information is invaluable for the government to make the best informed decisions possible.

This year, the health system performance assessment report offers a broader approach. It brings us invaluable information about the health system and the impact of health reforms steps undertaken to improve the health care system. We need to use this information and translate it into action to improve performance. These are not vague terms: it means adding years of life to our people by reducing the incidence of diseases; it means getting them better access to health care services when they need them by reducing the level of out of pocket payments and other barriers to care. It also means that the Ministry of Health will use the findings and recommendations of the Report to build the policies, regulations and legislation which tomorrow will make the Armenian health system a true system, which directs all its resources to making the people of Armenia healthier, and keeping them healthy.

Harutyun Kushkyan
Minister of Health of the Republic of Armenia

EXECUTIVE SUMMARY

In June 2008, the 53 Member States of the WHO European Region met in Tallinn, Estonia, and endorsed the Tallinn Charter, which concerns national health systems *(1)*. The goal of the Charter is to improve people's health by strengthening health systems, while acknowledging the social, cultural and economic diversity of the Region. In signing the Charter, the Member States committed themselves to transparency and accountability in order to achieve measurable results in health system performance. A regular process of health system performance assessment (HSPA) is an important first step to meeting these commitments. Such assessments underpin health system stewardship by ensuring that:

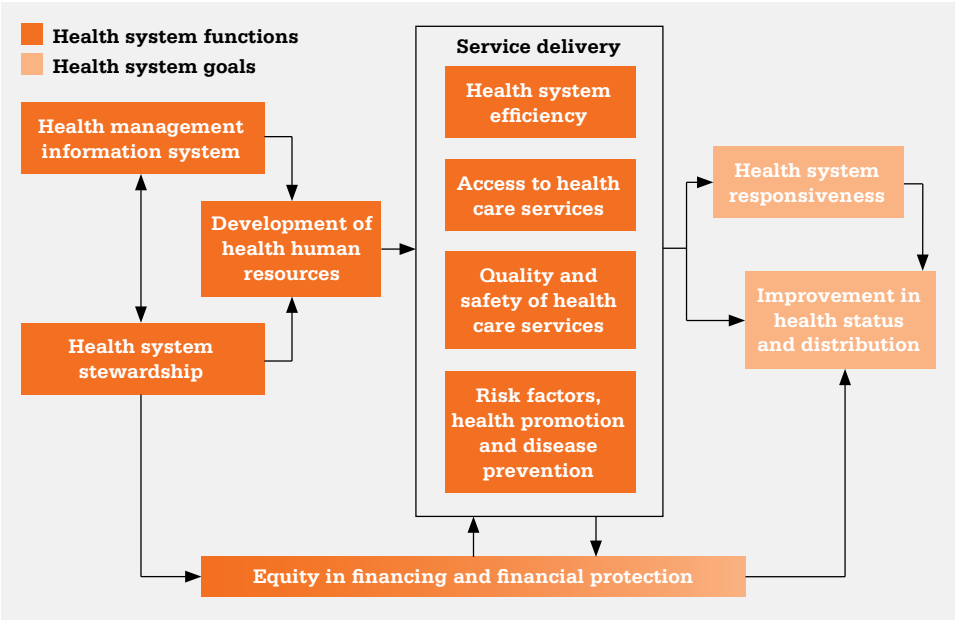
- the health system has a strategic direction that focuses on improving health outcomes for the population;
- policy decisions are informed by appropriate understanding and data concerning health problems and their determinants;
- all government policies contribute to better health for the people of the country;
- every aspect of government promotes healthy policies; and finally,
- an environment of transparency and accountability helps regulate the relationships among all health stakeholders.

In the context of the commitments expressed in the Tallinn Charter, and in order to assess the performance of the health system as it undergoes restructuring and reform, the Government of Armenia and its Ministry of Health undertook a formal HSPA project. Its first report was issued by the Ministry of Health in 2007, focusing on several specific areas of health system performance: primary care reforms, optimization of hospital care, and maternal and child health. The 2009 report takes a broader perspective and assesses the performance of the health system as a whole. The project is a joint effort by the Ministry of Health, the WHO Regional Office for Europe and the World Bank.

A health system has three ultimate goals: better health, responsiveness and equity in financing. Together with a functional approach to stewardship, resource generation, funding and service delivery, these goals provide a framework for assessing the system's performance. This framework was then adapted to Armenian health system

strategies and reforms. Ten performance dimensions related to the functions and goals of the health system were defined in order to focus the assessment on the role of health system policy and policy development in improving performance. (See Fig. 1 for an illustration of how these 10 performance dimensions are composed of system goals and functions, and Annex A for a presentation of how they relate to policy questions and performance indicators.)

Fig. 1. Health system performance dimensions for Armenia



With respect to the defining goal of the health system – improvement in health status – there has been tentative improvement over the past decade in some performance measures, but there remains concern about the sustainability of these results. Life expectancy has not increased markedly in recent years, having increased only slightly among females since 1990 and not at all among males, whose life expectancy is five to six years less than that of females. Measures of child and infant mortality have improved, yet they still remain significantly higher than the 2015 Millennium Development Goals (MDGs) for Armenia *(2)*. Maternal mortality is highly variable since, due to the country's small population, a few maternal deaths can change the rate considerably, but it appears not to have changed much over the past decade, and it too is still higher than the target rates.

Stagnation in health impact indicators such as these ones results, directly or indirectly, from the insufficient performance of health system functions. Assessment of health system performance with respect to the instrumental goals and functions of the Armenian health system should lead to policy recommendations and strategy suggestions that can help improve the system's overall performance and lead to long-term, sustained improvement in health status.

On the subject of health system stewardship, it is important to recognize that while the Ministry of Health has drafted health policies and strategies in the past, these still fall short of providing an integrated, long-term vision for the way forward. An overall health system reform strategy would provide for coordinated, coherent strategies that range from primary care and hospital optimization to specific health sector programmes for areas like maternal and child health care. Development and implementation of such an overall strategy could be supported by creating a health policy and planning unit within the Ministry of Health. This unit could coordinate joint decision-making and implementation, accountability among health system stakeholders, and donor assistance. The present assessment effort also found that evidence and information could be better utilized to inform the development of policy and strategy and to systematically monitor and evaluate the implementation of reforms.

This report makes recommendations to address some of the limitations in the country's health management information system. These recommendations would support and advance the use of evidence and information. A review of existing systems and methods for collecting, reporting and analysing health information noted that although there are many such systems in place, action is needed to improve the efficiency of these systems and to improve data availability, quality and use. Previous assessments of health system information led to the development of a 10-year strategic plan for health information in 2008 *(3)*. A health information system (HIS) task force comprised of representatives from key health sectors could oversee the implementation of the recommendations from this plan and lead the work of harmonizing information systems. Priority areas requiring attention include improving the quality of vital registration information, harmonizing existing health information surveys to ensure methodological consistency, and expanding the capacity to analyse trends and prepare subnational reports.

The mix of health human resources appears unbalanced. The ratio of general practitioners to "narrow" specialists has been decreasing over the past few years, despite a strategy to invest more in the retraining of general practitioners to support primary health care. Additionally, both the number of nurses per 100 000 population and the

ratio of nurses to physicians are low compared to other countries. The distribution of nurses and physicians is uneven among the 10 *marzes* (provinces), varying significantly in their concentration per 100 000 population. Action is needed to develop overall health workforce plans to address both the mix and distribution of health professionals. Such plans will also require appropriate incentives and enforcement mechanisms to ensure that the targets are met.

As primary health care reforms and hospital sector optimization have been implemented over the past few years, the efficiency of the health care system appears to have improved. Although public expenditures have increased in both the primary care and hospital sectors, an increasing proportion of health sector investment has gone to strengthen the primary health care system. Survey results indicate that more people are making the primary care system their first choice when they need care. However, it is important to ensure that the long-term strategy for primary health care is clear to providers and that payment methods, incentives and enforcement mechanisms support the implementation of this strategy. Optimization has meant that the hospital system is close to achieving its targets for numbers of beds in some marzes, and bed occupancy rates have also risen, indicating better use of facilities, while the average length of stay has decreased. Nonetheless, results for occupancy rates and length of stay still lag behind the corresponding measures in many of the other countries in the European Region.

Increases in health system efficiency need to be considered in conjunction with improvements in the quality and safety of services. It is important as efficiency improves to have good measures to monitor the quality and safety of health care services. The incidence of adverse hospital events (such as surgical site infections and medication errors) and hospital readmission rates are two key measures that are currently not available, though they would help ensure that increased efficiency does not come at the expense of quality and safety.

The quality of health care services is also reflected in the clinical outcomes of care. The results in this area have been mixed. Hospital fatality rates have improved somewhat since 2001, indicating possible improvements in care quality and/or safety. On the other hand, the rate of early detection of malignant neoplasms has not changed over the last few years. Survival rates for breast cancer have increased somewhat, but screening rates for breast and cervical cancer are very low. Screening and early detection of malignant neoplasms could be improved through targeted, organized programmes, possibly delivered through primary care services.

Quality health care services cannot lead to better outcomes and improved health status if people cannot access these services. It is possible that lack of access to effective cancer treatments, including chemotherapy drugs, is one of the factors behind the relatively low cancer survival rates. Although utilization rates for both outpatient and inpatient services have increased since 2001, the rates still remain low compared to other countries and vary considerably from marz to marz. Although access does not equal utilization, the increased utilization rates suggest that there are fewer barriers to access for a significant portion of the population. The proportion of people who did not seek care when they felt they needed it decreased from one in four in 2007 to one in five in 2009. However, of those who did not seek needed care, the proportion who declined to seek it due to financial reasons increased from roughly one half to more than three quarters. The Ministry of Health needs to ensure that it reviews and addresses financial barriers to access during the design and implementation of co-payment policies, which should focus particularly on the disadvantaged.

An assessment of the main health financing objectives of the health system shows that although government health expenditures have increased, households continue to finance the largest share of health system expenses, largely through informal, out-of-pocket payments for services at the point of delivery. Government spending on health should continue to increase, and should focus on removing the burden of out-of-pocket payments. Policy measures to consider include reviews of the content and scope of the government-funded basic benefit package, of the payment systems used by the State Health Agency (SHA) and of the actual prices paid for services. Eligibility policies for state health benefits should also be reviewed, with serious consideration given to using a means-tested method for determining eligibility to improve targeting of subsidies to the poor. Although the level of out-of-pocket payments is one of the biggest problems in Armenia's health system, it cannot be solved in isolation. The Government needs to consider a policy package that will address the interconnected problems involved and to ensure there is a good monitoring and evaluation system to assess the impact of this package. If coupled to further increases in the government health budget, such a package should make it possible to reduce the current financial barriers faced by the population in accessing care.

The Armenian population appears to be aware of the most significant behavioural health risks. However, this awareness has not translated into reductions in the relevant behaviours during the past few years, and current patterns of risk behaviour do not bode well for the future incidence of cardiovascular diseases, chronic diseases such as diabetes, and cancers. Unfortunately, with the exception of physical inactivity, the risk factors are much more prevalent among people in the lower income quintiles. This

concentration of risk will only exacerbate potential population health issues in future, given the financial barriers to care that low-income Armenians must overcome. To facilitate a better understanding of the prevalence of risk factors, health behaviour surveys (e.g. the ad hoc HSPA survey and the Armenian Demographic and Health Survey (ADHS) scheduled for 2010) should be harmonized and coordinated. In turn, this heightened understanding of risk patterns could lead to better targeting and the development of programmes and policies to achieve maximum impact and reduce the incidence of noncommunicable diseases.

The responsiveness of a health system is difficult to assess, as it is defined in part by subjective expectations of the populations it serves. The 2009 HSPA survey asked respondents to describe their feelings about system responsiveness in four areas – confidentiality, communication, dignity and autonomy. The results were generally positive and showed some improvement from the 2007 results. Nonetheless, a key component of system responsiveness is enabling individuals to access its services. "Would-be users" who cannot, or for various reason choose not to, access the system cannot provide their impressions of responsiveness. Additional survey work, with more objective and refined measures to assess responsiveness by marz and provider type would enable a much more thorough assessment of responsiveness and provide more direction on policies for improvement.

Financial barriers preventing access to health care services can significantly limit the contribution of other health system reforms to the primary goal of improving health. If the financial burden involved in accessing services is too high, many people cannot benefit from a well-planned health workforce. They cannot take advantage of high-quality, safe services. And they cannot utilize the diagnostic services involved in screening, nor obtain the medicines required for treatment.

The second key area to address in order to improve population health is the prevalence of lifestyle behaviours that put a significant portion of the population at risk for the morbidity and mortality associated with noncommunicable diseases such as cardiovascular diseases and cancers. And finally, progress on the instrumental goals of health system stewardship and health system information can underpin improved performance throughout the health system, leading to better population health.

Table 1. HSPA: key priorities for performance improvement

Key priority	Expected impact on the health system
Addressing prevalence of behavioural risk factors, particularly smoking among males, and focusing programmes on those in lower-income households	Will decrease the incidence of noncommunicable diseases and the burden of these diseases, particularly on lower-income households
Reforming the basic benefit package in terms of its content, the depth of its financial protection and, by shifting to means-tested eligibility criteria, the population groups it covers; and reinforcing the package with continued increases in government funding	Will remove financial barriers; better align incentives for health professionals to deliverquality services; and improve equity in financing
Continuing implementation of primary health care reforms and hospital optimization, and addressing development of professional hospital management	Will improve the efficiency, quality and effectiveness of health care spending and maximize the value of government investment in health
Developing standards and key indicators for the quality and safety of health care services, including such services' adherence to clinical guidelines	Will monitor the impact of increased efficiency on services and develop payment mechanisms that reward service quality
Developing an overall strategy and vision for the health system, supported by a health policy and planning unit in the Ministry of Health	Will coordinate and provide coherence to primary care reform, hospital optimization, health workforce planning and dismantling of financial barriers to access
Increasing capacity for health system information management through implementation of the HIS strategic plan, and through improved access to data and information	Will improve the use of information and evidence in carrying out the stewardship function, and will promote transparency and accountability

INTRODUCTION

This report is the second HSPA report for the Republic of Armenia and an important continuation of the first report's review of the progress and impact of health system reforms in the country *(4)*. Improving performance of national health systems is of paramount importance, given the need to maximize the value of existing resources, particularly in the current economic climate. Toward this end, *health system performance assessment (HSPA)* is an approach whose effectiveness in measuring health system performance and focusing on necessary improvements has been recognized by the Member States of the WHO European Region *(5)*.

In June 2008, the 53 Member States from the WHO European Region met in Estonia and endorsed the Tallinn Charter: Health Systems, Health and Wealth *(1)*. The goal of the Tallinn Charter is to improve people's health by strengthening health systems while acknowledging the social, cultural and economic diversity of the region. In the Charter, the Member States committed themselves to transparency and accountability in order to achieve measurable results in improving the performance of health systems. Box 1 summarizes their commitments.

A first step suggested in the Tallinn Charter is the development by each Member State of regular processes to assess the performance of its health systems. These assessment efforts can help ensure that the health system has a strategic direction focusing on improving health outcomes for the population; that policy decisions are

Box 1. The commitments of the Tallinn Charter *(1)*

- To promote shared values of solidarity, equity and participation through health policies, resource allocation and other actions, ensuring due attention is paid to the needs of the poor and other vulnerable groups;
- to invest in health systems and foster investment across sectors that influence health, using evidence on the links between socioeconomic development and health;
- to promote transparency and be accountable for health system performance to achieve measurable results;
- to make health systems more responsive to people's needs, preferences and expectations, while recognizing their rights and responsibilities with regard to their own health;
- to engage stakeholders in policy development and implementation;
- to foster cross-country learning and cooperation on the design and implementation of health system reforms at national and subnational levels; and
- to ensure that health systems are prepared and able to respond to crises, and that we collaborate with each other and enforce the International Health Regulations.

informed by appropriate intelligence about health problems and their determinants; that all government policies contribute to better health for the people of the country; that healthy public policies are promoted in every aspect of government; and finally, that the relationships among all health stakeholders are regulated in an environment of transparency and accountability.

The health system in Armenia – background and challenges

Armenia declared independence in 1991, after seven decades under Soviet rule. Although the Soviet health care system had provided free medical care, with universal entitlement to a full range of primary, secondary and tertiary services, its approach to service provision devolved into a rigidly distorted, unsustainable system. The authority for all health sector decision-making (e.g. on budgeting, hospitals and staffing) was concentrated in the centralized Communist state apparatus, resulting in a lack of incentives and opportunity for local development. Centralized planning and budgeting put an unbalanced focus on specialized hospital care while primary health care remained underdeveloped; and since payments to hospitals were based on capacity indicators, such as bed numbers, hospitals were encourage to expand capacity to such an extent that it greatly exceeded what demand required. The challenges of the post-Soviet transition period have included the disintegration of the former social safety net, which Armenia has addressed by crafting health care provision and financing schemes that will meet needs more efficiently. The reform efforts have included establishing a sensible balance of hospital and primary health care, making such care accessible and reigning in excessive informal payments.

The role of the Armenia Ministry of Health has been to license, regulate, monitor and set guidelines for service provision, rather than to act as a direct provider of services. The Ministry addresses policy issues in four major reform areas: service delivery, human resources, financing and stewardship (strategic leadership) *(6)*.

With regard to service delivery, the most important objectives pursued by the Ministry are to prioritize primary health care, to optimize the hospital network and reduce the number of hospital beds, and to stimulate the integration of care. Two important strategies for the Ministry have been to decentralize service provision to regional and local governments and to devolve the government's financial responsibility by permitting the privatization of services. However, instead of reducing excess capacity and informal payments, unregulated privatization has expanded an inefficient system even further, one that is notably marked by a surplus of beds and low hospital

occupancy rates. The 1996 Health Care Law abolished the former system of health care financing and made alternative financing schemes possible. In 1997–1998, the government first made an effort to implement official user fees, and then to introduce a basic government-paid care package – the *basic benefit package*. This package was designed to provide a set of limited services for the entire population and broader services for certain vulnerable groups. Unfortunately, the majority of health financing remains largely based on informal, out-of-pocket payments, which can lead to inequalities in health care access and health outcomes *(7)*.

Undertaking an HSPA

An HSPA is built on the framework for health systems outlined by WHO in the *World health report 2000 (8)* and documented further by Murray & Frenk *(9)*. The WHO framework considers better health to be a health system's main objective – its *raison d'être* – and hence its defining goal. Furthermore, this primary objective of improving health is understood to have two intrinsic, socially desirable goals. The first is "responsiveness," or "goodness" (meaning that a health system should respond well to what people expect of it), and the second "fairness" (implying that the system response should be equal for all, without discrimination). There are thus three ultimate goals for any health system.

1. *Improving health*, a health system's defining goal, is concerned with both (a) raising the average level of population health and (b) reducing health distribution inequalities.

2. *Enhancing responsiveness* has two components of (a) showing people respect and (b) orienting clients.

3. *Fairness in financial contribution*, or equity in financing, is concerned with ensuring that households do not become impoverished in obtaining needed health care, and that poor households pay less into the health system than rich households.

Supporting these three fundamental goals are the four functions that a health system performs.

1. *Stewardship* is concerned with what the Tallinn Charter describes as "set[ting] the vision for health system development and [with] the mandate and responsibility for legislation, regulation and enforcement of health policies, as well as for gathering

intelligence on health and its social, economic and environmental determinants" *(1)*. Stewardship also involves advocating and leading concerted intersectoral and multi-stakeholder efforts to maximize population health gains and ensure health system preparedness for manmade and natural disasters.

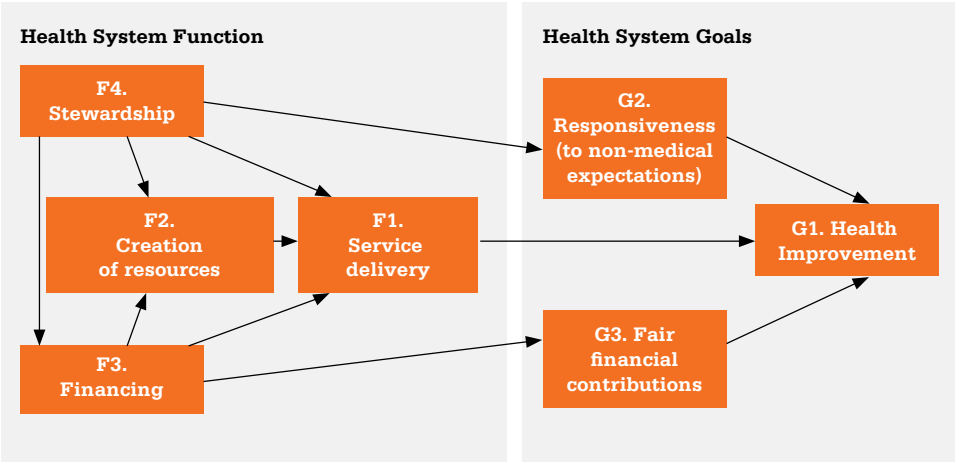
2. *Health system financing* is concerned with the sources of funds, and how they are raised and pooled to invest in and pay for health system resources and capacities.

3. *Creation of resources* is concerned with ensuring that system resources – human resources, facilities, etc. – are in place and are sufficient to deliver the health services needed.

4. *Service delivery* refers to how these health services are delivered – their quantity, quality, geographic location and accessibility.

The relationships among the four functions and three ultimate goals of health systems can be represented as shown in Fig. 2.

Fig. 2. Framework of health system functions and goals



F: function, G: goal.
Source: WHO, 2000 (7).

The objectives of HSPA – and this report

Assessing health system performance involves measuring and analysing two things:

1. how well a health system is meeting its ultimate (or intrinsic) goals (better health status for the population, better health system responsiveness and better financial protection); and

2. how its performance in meeting intermediary objectives (or instrumental goals, such as improved access, coverage, quality and safety of health services) contributes to achieving its ultimate goals.

HSPA can have a direct role in improving the performance of health systems by embedding strategic performance information into decision-making processes and supporting policy-makers in assessing and readjusting strategies, plans, policies and related targets.

This second HSPA report for Armenia builds on the first one, and it serves thereby as a critical component in monitoring the changes that are occurring in the health system as a result of government policies, health system reform initiatives and the underlying social and economic changes in Armenia.

The present report has been prepared to help achieve several objectives:

- to assess the level of attainment for core health system goals and monitor the changes taking place in the system;

- to provide a summary assessment of health system performance;

- to situate the performance of the health system at the centre of national health policy;

- to enhance the effectiveness of health system stewardship;

- to enable evaluation of the efficiency of the health system;

- to facilitate communication and promote accountability;

- to indicate which areas of health system performance are priorities for improvement efforts; and

- to stimulate the search for better data and better analyses throughout the health system.

It is hoped that by providing a broad framework for measuring health system performance and by selecting a reliable set of core performance indicators, the report will also help improve accountability and reinforce efforts to effectively manage the performance of the Armenian health system.

Development of this report

The present assessment of the Armenian health system is a joint effort of the Ministry of Health, the WHO Regional Office for Europe and the World Bank. A working group responsible for the HSPA, situated in the National Health Information Analytical Centre (NHIAC) of the National Institute of Health, was established to work with WHO experts to develop the report. Four WHO technical missions were conducted between May 2008 and September 2009. During the first mission, policy-makers in the Ministry of Health worked with WHO staff members to develop a health system strategy map, building on the framework described above. The health system strategy map for Armenia articulated four ultimate goals for the health system and nine strategic health themes, reflecting Armenian health system objectives and reform strategies.

This strategy map was used as a frame to select approximately 40 performance indicators during a workshop with technical experts in July 2008. The HSPA working group had preselected a large number of potential indicators in advance of the workshop. Between August 2008 and June 2009, the working group revised an ad hoc survey funded by the current World Bank loan, in order to fill in existing data gaps due to limitations in routinely collected data. This survey was carried out in Spring 2009 by the National Statistical Service (NSS), using a sample size of 1600 households for national estimates. The resulting data were released to the HSPA working group in Summer 2009. During the WHO mission of June 2009, the working group, with the support of WHO experts, proposed organizing the strategy map's 13 strategic goals and health themes into 10 performance dimensions for the final HSPA report. Guidelines were developed to support the efforts of the working group in interpreting the indicator results. A first draft of the present report was reviewed in detail during the final WHO mission at the end of September 2009.

Framework for the Armenian HSPA

The WHO framework outlining three health system goals and four functions, as described above and shown in Fig. 2, was adapted to reflect Armenian health system strategies and reforms. Ten performance dimensions relating to the functions and goals of the WHO model were then defined in order to focus on the role of health system policy and policy development. These performance dimensions were used to articulate policy questions; performance indicators were selected to respond to the policy questions; and the indicator results formed the basis for assessing health system performance.

The 10 performance dimensions and their relationship to the health system functions and goals are illustrated above in Fig. 1. The dimensions and the related policy questions and performance indicators are summarized in Annex A.

Format of the report

This report reviews health system performance in the 10 dimensions shown in Fig. 1. Each chapter sets out the related policy questions for one of these dimensions, presenting the results for the corresponding performance indicators and formulating conclusions and policy recommendations where relevant.

In order to assess performance, results for the indicators have been tracked over time and trends reviewed. The 2008 data for most indicators are now available and can be reported. Provided the data are available, trends are assessed from 2000 or 2001 forward. Data points for 1990 and 1995 are also included for some indicators, though it should be noted that data from those years were gathered under different collection and reporting regimes and may not be comparable to more recent results.

Additionally, a second integrated survey for HSPA was conducted during March and April 2009 (the 2009 HSPA survey), referring to health status and health care utilization during the previous 12 months. These results can be compared to those from the first survey conducted in 2007 (the 2007 HSPA survey).

Where data are available, results for Armenia have been compared to those for other countries and to population-weighted averages for three groups of European countries. The countries used for comparison include Georgia, Azerbaijan and Turkey, since they are Armenia's chief neighbours. The country groups used include the 12 countries in

the Commonwealth of Independent States (CIS); the 26 European Region countries with relatively high mortality rates (ER-26), including all 15 former Soviet republics[1]; and the other 27 European Region countries (ER-27), which are mostly developed western and central European countries with low mortality rates[2]. International comparisons have usually employed the most recent results in the European Health for All Database (HFA-DB) *(10)*, which are now generally available for 2006 or 2007.

The results for performance indicators are also assessed against any targets established by the Armenian Government in its strategic plans or by the Millennium Development Goals (MDGs). Also, performance indicator results are presented by marz (regions) wherever the data are available, in order to understand the extent of regional variation in health system performance.

The objective of the first HSPA for Armenia was to focus on three priority areas: primary health care reform, optimization of the hospital sector, and maternal and child health. This second report takes a broader approach to assessing performance for the whole health system, thereby providing an opportunity to build and expand upon results from the first report in several areas. The new material includes:

- a first look at the recent changes in Armenia's health system, based on comparing the results from the first HSPA report to the 2008 results available now;
- an examination of indicator trends beginning in 2000, when a period of rapid economic growth began in the country;
- an effort to highlight associations between health system performance and health system reforms, using outcome indicators relating the impact of specific reform programmes (such as primary health care reform and hospital optimization); and
- an analysis of health status and health care service utilization by population wealth quintile to determine the extent of health equity and access to health care by wealth group.

1 Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Montenegro, Poland, Moldova, Romania, the Russian Federation, Serbia, Slovakia, Tajikistan, The former Yugoslav republic of Macedonia, Turkey, Turkmenistan and Uzbekistan.

2 Andorra, Austria, Belgium, Croatia, Cyprus, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Luxembourg, Malta, Monaco, the Netherlands, Norway, Portugal, San Marino, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Finally, this report also references a more detailed assessment of Armenia's health information system (HIS) *(11)*, and it incorporates that assessment's findings and recommendations for strengthening health information management in the country.

1. HEALTH SYSTEM STEWARDSHIP

The Tallinn Charter *(1)* states that the core stewardship functions of a health ministry are to "set the vision for health system development and have the mandate and responsibility for legislation, regulation and enforcement of health policies, as well as for gathering intelligence on health and its social, economic and environmental determinants". The subsidiary functions of this stewardship role have been defined as follows:

- to define the vision for health and the strategy to achieve better health;
- to exert influence on other sectors and advocate for better health;
- to govern the health system in a manner that is values-based, ethical and conducive to attaining its goals;
- to ensure that the health system is designed in such a way that it can adapt to changing needs;
- to mobilize legal and regulatory powers to attain health system goals; and
- to use evidence in decision-making *(12)*.

Within the framework of the present HSPA, it was not possible to carry out a full evaluation of the effectiveness of the Ministry of Health's stewardship function. Methods to carry out such evaluations are still being developed by the WHO Regional Office for Europe *(13)*. It was decided to pose some specific policy questions, using them as proxies to assess the strengths and weaknesses of the Ministry's stewardship of the health system.

- Is there adequate regulation of the health care sector?
- Does the Ministry of Health have appropriate policy instruments at its disposal to pursue targeted policy objectives?
- Are health system performance information and evidence used for decision-making in the Ministry of Health, especially in allocating public resources to promote equitable access to health care?

- Does the Ministry collaborate with other sectors of government? For instance does it work with the ministries of education, transportation, environment, infrastructure, etc. to coordinate and develop policies that have a significant impact on population health status? Is the impact of major policies and reforms in these other sectors assessed?

For this report, qualitative observations on the above stewardship functions were formulated that draw largely on a recent assessment of Armenian health sector reforms that covers these functions *(5)*. One worthwhile objective for a future HSPA would be to define quantitative measures and establish a baseline for assessing improvement over time.

Policy instruments mobilized to achieve objectives

The Armenian Ministry of Health has been responsible for major health sector changes since independence, including decentralizing the health system, improving the balance between primary and hospital care and establishing financing mechanisms for the health system. In its strategic leadership capacity, the Ministry of Health sets priorities, formulates policies and seeks legal support to ensure that proper strategies are developed and implemented.

To date, the Ministry of Health work on drafting health policies and strategies has been in line with the Tallinn Charter principles, starting with the earliest law on medical assistance and services for the general population (1996) and the introduction of user fees (1997). The Ministry's 2000 health care strategy identified the main components to address in health care reform, including primary health care, hospital care and related financial and human resource adjustments. It also promoted joint decision-making, implementation and accountability in promoting health development policies. The 2000 health care strategy provided sector guidance for 2000–2003, after which another interim strategy was developed.

There remain numerous challenges in implementing these strategies. In the absence of an overall reform strategy for the national health system, policy changes have been ad hoc, making the future direction of reform uncertain. Decentralization has fostered excessive autonomy among public and private service providers, making the delivery and funding of health care services difficult to regulate. The Ministry of Health has not developed sufficient licensing and quality standards, nor has it contributed to the selection of properly trained health care management. Attempts to create a health

policy and planning unit in the Ministry of Health, in order to provide leadership support and ensure the coherence of substrategies developed by Ministry departments and agencies, have not succeeded. Likewise, there is no coherent process for consulting with stakeholders on the formulation and implementation of reform measures, or on the coordination of donor assistance.

Use of health information for evidence-based decision-making

As with other stewardship functions, the capacity to successfully manage and regulate the health sector is closely related to the availability and use of health information. One of the ways of examining the use of health information is to look at the extent to which Ministry of Health programmes are monitored and evaluated using indicators with established targets. The indicator used to assess the use of health information is the percentage of state health programmes with monitoring and evaluation indicators that are being reported.

The 2007 HSPA report outlined a plan to improve such assessments in future. First, performance-based reporting would permit objective measurements of progress. Performance-based measures are integrated into several national planning instruments, including two socioeconomic development programmes: the Armenian Government Programme for 2008–2015 and the Armenian Sustainable Development Programme (the Poverty Reduction Strategy Paper 2). The public Medium-Term Expenditure Framework also defines targets related to health. Health sector programmes, including 12 existing programmes and 2 under development, tend to use performance-based reporting in their annual reports (see Annex B, for a list of the programmes and their use of monitoring indicators). These indicators, however, are not always presented systematically, and even when targets are included, the targets may not be clearly defined. For example, a target might be defined as a 50% reduction over a period of time, but if the baseline value or year is not specified, it is difficult to assess whether the target has been achieved. This shortcoming is particularly noticeable with some of the targets associated with the maternal and child health programme.

In order to provide appropriate oversight of these programmes and be confident of the value received for the investment made, each programme needs to inform the Armenian Government and the Ministry of Health in every annual report whether it is on track to meet the established targets. If not, the programme should discuss the factors that are leading it to fall short, the actions that could be taken to get the programme back on track and, as appropriate, the need to reassess targets.

Not only would an improvement in performance-based reporting facilitate assessment, but so would an improvement in data transparency, particularly by making metadata and microdata more accessible. For example, in order to generate many of the indicators in this assessment report, the analysts often had to depend entirely on intermediaries in other areas of the Ministry of Health or from other government ministries for the data. The opportunities for analysis were therefore often constrained due to lack of direct access to data and limited opportunities to ask questions about the data. Access to well-documented data is important not just for analysts conducting an HSPA, but also for any manager or researcher who provides advice and insight that may inform health policy. A concomitant of better data access is the obligation to anonymize personally identifiable information to protect the privacy of individuals, an obligation that is supported by Armenian law.

Intersectoral collaboration to promote and improve health

The principles of stewardship recognize that many actors and organizations can help improve the health of the population, and that as a steward, the Ministry of Health must ensure that all sectors, ministries and agencies collaborate on and contribute to health. Policies and activities in many sectors – for example, environment, transportation and road safety, education, etc. – have a significant impact on health. For this HSPA, the extent of intersectoral collaboration was not specifically assessed. However, instituting a formal process of health impact assessment and adopting "health for all" approaches to policy-making would provide a structure that would make such collaboration commonplace.

Summary of findings and policy recommendations

It is important to recognize the key role that information management plays in health system stewardship. Good stewardship requires good health information. Evidence-based policy-making, decisions about allocating health resources, the development and enforcement of health regulations, etc. cannot take place in an information vacuum. And health information is not useful if it is not accessible to those who require it for analysis and decision-making. A critical component in the development of sound policies is therefore access to and use of reliable health information.

Table 2. Findings and policy recommendations: health system stewardship

Situation	Policy recommendations
While the Ministry of Health has drafted health policies and strategies in the past, they still fall short of providing an integrated, long-term vision for the way forward. Broadly, the shortcomings consist of: 1. the absence of an overall health system reform strategy that would provide for coordination and coherence of strategies in areas such as primary health care, hospital optimization and specific programmes (e.g. maternal and child health care); 2. limited policy instruments for achieving objectives such as the licensing of providers, the establishment and oversight of quality standards, and the enforcement of health financing policy; 3. the lack of any formal influence in appointing the managers of health care organizations; 4. the absence of a health policy and planning group that would use health information and evidence to provide advice and support to the Ministry leadership; and 5. the absence of any established process for consulting and negotiating with stakeholders on reforms or new policies, thus impeding successful implementation of changes.	Adopt a long-term national health system strategy that maps out all national strategies, plans and programmes, as well as stating priorities. Create a health policy and planning unit in the Ministry of Health to ensure coherent implementation of the national strategy, and to coordinate joint decision-making, implementation and accountability with stakeholders. This unit should also facilitate the coordination of donor assistance. Develop mechanisms to enforce licensing criteria for health care providers and to relicense health professionals. Develop and disseminate quality standards and norms for health care providers (for example, clinical practice guidelines), and develop a mechanism to audit compliance. Establish requirements for the appointment of health care organization managers, for example, specific training in health management.
The degree and quality of intersectoral collaboration could not be assessed due to a lack of data; neither could the quality of the disaster preparedness plans.	Include in the next HSPA report an assessment of these dimensions of stewardship: 1. health system planning for disaster-preparedness and the testing of such plans; and 2. the extent to which ministries and government sectors outside of the Ministry of Health consider the impact of their policies on population health, and the extent to which they collaborate with the Ministry of Health in developing policies that promote health.
Monitoring and evaluation indicators are defined for many health sector programmes but do not have clearly articulated targets.	Clearly define specific indicators to be monitored in health sector programmes, and identify the data sources and quality issues involved in tracking these indicators. Establish targets for indicators and a review process for determining progress.
The links in information access, transparency and sharing, for facilitating evidence-based decision-making, are weak, even between and within ministries.	Document meta- and microdata according to international standards and archive them in a central data repository, to facilitate access and sharing of information.

2. HEALTH MANAGEMENT INFORMATION SYSTEM

A health information system (HIS) that provides reliable, timely, high-quality information is a key prerequisite for good health system stewardship. Good health information is essential for evidence-based planning, monitoring, evaluation and policy formulation. It is also essential for the regulatory activity required to monitor the quality and safety of health service provision.

WHO conducted a Country Health Systems Surveillance (CHeSS) situation analysis in Armenia during the week of 28 September 2009 *(10).* The detailed report describes Armenia's health management information system, its major health information institutions, potential barriers to the functioning of the information system and pertinent recommendations. The full CHeSS report includes a data quality assessment of selected 2009 HSPA indicators, which is presented in Annex C of this report. It compares indicator estimates from various data sources in order to assess the possible range and reliability of certain health status indicators. The main findings and recommendations from the CHeSS report are summarized below.

Main CHeSS findings *(10)*

Armenia's health administration structure consists of two levels, with the first level consisting of 10 provinces (marzes) and the capital Yerevan, considered the equivalent of a province.[3] The second level consists of 37 rayons, which are former administrative units from the Soviet period. The *2008 annual statistical Report*, published by the NHIAC,[4] indicates the presence of the following types of medical facilities: independent hospitals, unified hospitals, health centres, maternity hospitals without antenatal clinics, maternity hospitals with antenatal care and dispensaries with inpatients. There are about 1000 health facilities that report annually to the NHIAC, including all public and some private facilities. Approximately 40% of the reporting facilities are private, most of them dental clinics. An unspecified number of private

3 The 10 provinces are Aragatsotn, Ararat, Armavir, Geghark'unik', Kotayk', Lorri, Shirak, Syunik', Tavush and Vayots' Dzor.

4 "Health and Health Care of Armenia" Annual Statistical Report, Armenia [2006, 2007, 2008 in English, on-line http://www.niharm.am/IAC.htm]

facilities are believed to be among those not reporting; however, the exact number and extent is difficult to verify.

The main institutions involved in the collection of Armenian health and population statistics are:

- the National Health Information Analytical Centre (NHIAC), the clearinghouse for routine information reported annually by public and private health facilities and hospitals;

- the State Health Agency, which is responsible for collecting information from contracted hospitals about their activities and finances;

- the National Statistical Service (NSS) Department of Demography and Census, which conducts the decennial census and classifies causes of death based on the *International statistical classification of diseases and related health problems*, 10th revision (ICD-10);

- the NSS Department of Household Surveys, which conducts regular surveys and ad hoc surveys to monitor health expenditures, health service utilization and health risk factors; and

- the Department of Civil Status Registry (CSR), which manages the vital registration system.

Health management information systems are in place to measure the key demographic and health trends. The vital registration system and the decennial census are used to track population shifts; regular population-based surveys measure household health expenditures and monitor health trends; and a routine data collection system tracks dynamics in health service provision and access.

In addition, a wide array of health statistics publications is available, including regular time-series publications as well as many individual studies. Reports are available in hard copy and often electronically via institution websites. Many publications are published in both Armenian and English. Another component of the country's health management information system is a network of institutions involved in health-related research; the Public Health Alliance Group consists of nongovernmental organizations (NGOs), multi- and bilateral institutions and national stakeholders.

Data limitations and gaps

Several electronic data collection systems have been established to gather routine administrative health information and to conduct surveys. However, the existence of data limitations and gaps show that significant action is still needed to improve data quality, access and harmonization. In some cases, data limitations have affected the reporting of specific performance indicators or the interpretation of trends. The main limitations are summarized below, by data source; a more comprehensive assessment is found in the CHeSS situation analysis report *(10)*.

1. *Census data*. Official estimates from the 2001 census are projected based on de jure population and do not take into account high levels of undocumented emigration (meaning that the official population estimates are overestimates). This source of error mainly affects mortality and morbidity indicators.

2. *Vital registration*. In 2005, Armenia adopted the WHO standard definition of "live birth", but a degree of underreporting is still detected, especially for live births that are followed by early death, in which case neither the birth nor the death may be registered. Childhood deaths and individual maternal deaths are double-checked with the NHIAC. This process of data verification, together with registration incentives introduced in recent years, should be improving the completeness of birth and death registration.

3. *Cause-of-death certification*. The quality of cause-of-death data could be improved if physicians, especially those practising outside Yerevan, received supplementary training in death certification. In addition, only a short list of 229 causes is currently coded electronically. This practice results in the cause of death often being "coded up" to a more general category, such that information is lost and detailed analysis compromised.

4. *Health facility routine reporting*. The facility database at the NHIAC does not include all private facilities, and Global Positioning System (GPS) coordinates are not available. Annual reporting forms are numerous and burdensome; the information being reported needs to be updated, streamlined and reported more frequently. Mechanisms should also be instituted for the regular verification of data quality by an independent entity.

5. *Household surveys*

   » Harmonization of survey design. The indicator estimates relating to risk factors, health system responsiveness and patterns of health service utilization are derived primarily from population-based surveys. However, there are substantial differences in sample and questionnaire design among surveys, compromising the comparability of the estimates. For example, the Armenia Demographic and Health Survey (ADHS) and the HSPA survey differ in the age groups they target and the measurement approaches they use for several common indicators, impeding direct comparisons and leading to the loss of potentially informative trend information.

   » Integration of ad hoc surveys. Both the National Health Accounts (NHA) household survey and the HSPA survey are small ad hoc surveys sponsored by the World Bank, and both were conducted in 2006/2007 and 2009. Both surveys collect similar information, for example, national data on out-of-pocket health expenditures, and could be more efficiently integrated to provide regional level estimates

6. *Health finance data/NHA*. The monitoring of informal payments requires that results be reported more than once a year, which is how often the Integrated Living Conditions Survey (ILCS) and NHA survey currently report. Routine hospital financial data are fragmented and incomplete, and they are not systematically collected from non-contracted hospitals. Both the State Health Agency and the NHIAC collect some of the same information independently from hospitals, thus imposing some redundancy in reporting.

7. *Drug commodities*. For future HSPA reports, the procurement and monitoring mechanisms of the Ministry of Health and the Drug and Technology Scientific Expertise Centre should be assessed in conjunction with data on individual drug use from the household surveys.

Finally, public data access to microdata exists in principle, and there are policies on data access and anonymization. However, in practice access to microdata is difficult. Metadata and microdata are not documented and archived according to international standards, nor are they readily shared among institutions or with researchers.

Summary of findings and policy recommendations

Table 3. Findings and policy recommendations: the health management information system

Situation	Policy recommendations
Development and oversight Previous health information assessments have been performed, the most recent being in 2008 using the standard Health Metrics Network (HMN) methodology. This assessment led to the development of the HIS Strategic Plan 2008–2018, a detailed and comprehensive document laying out specific objectives and activities.	Create an HIS Task Force comprised of representatives from key health sectors to meet regularly to develop and harmonize information systems, and to carry out detailed recommendations in the HIS Strategic Plan 2008–2018.
Policy The CHeSS assessment process revealed the existence of policies obliging health facilities to report annually and specifying that microdata be accessible and anonymized. However, it is not apparent that these policies have been implemented and enforced with any effectiveness.	Review relevant policies and their enforcement to determine whether they adequately address the need for high-quality, timely health statistics, and whether they promote the accessibility, use and transparency of health meta- and microdata. Take steps to rectify any shortcomings. Review the licensing and regulation of private facilities in order to better enforce reporting requirements.
Data quality Armenia has well-established data collection mechanisms in place for routine data collection, for example, its vital registration system and the annual facility reporting system administered by the NHIAC. However, without regular data quality checks, both internal and external, the accuracy of the resulting data cannot be known.	Elaborate mechanisms to assure systematic data quality assessment in each data collection institution. In addition, for routine data, institutionalize periodic data quality audits by an independent entity.
Data source: household survey data The capacity to conduct household surveys is good. However, better survey planning, that addressed design, implementation and timing, could produce better information by: • improving comparability of estimates; • promoting more frequent monitoring of particular indicators of interest during the reform period; and • obtaining subnational level estimates to gauge the pace of reforms in different regions.	Harmonize survey design to improve comparability of indicators. For example, design survey samples, questions and response categories such that estimates for target populations will be comparable. Integrate information from ad hoc surveys for more efficient data collection. For example, the NHA household survey and HSPA survey could be integrated and the data collected more frequently (e.g. quarterly or semi-annually). A more efficient integrated survey could also be designed to provide subnational surveillance and allow monitoring of reforms in the individual marzes. It could also be conducted more regularly, e.g. as a rolling quarterly survey that allows more frequent monitoring of certain indicators.

Situation	Policy recommendations
Data source: facility assessment data A major information gap in the 2009 HSPA is the lack of facility-related information, including information on specific services available per 1000 population (by rayon or marz), and of service delivery "readiness" indicators. Such information is useful for evidence-based decision-making, especially when it is mapped and clearly presented.	Conduct a Service Availability Mapping (SAM) activity to establish a complete list of public and private health facilities and collect service availability and "readiness" data, e.g. the availability at each facility of core services, basic medicines, equipment and personnel, infection control, diagnostic/lab potential, etc. Map the results using GPS coordinates. The new list of facilities and GPS coordinates could be used to update the official list currently used by the NHIAC, and other routine information in the NHIAC database could then also be presented on maps. (Note that WHO technical support is available for SAM.)
Data source: routinely reported data The NHIAC collects administrative data from health facilities. However, the information reported appears excessive, and better streamlined and more frequent reporting would allow better monitoring and evaluation opportunities.	To improve content and monitoring of routine data, streamline outdated annual reporting forms and increase the frequency of reporting to quarterly or monthly. Make the reported data accessible in a centralized database, and undertake interagency consultation to avoid duplicate reporting streams. (For example, both the State Health Agency and NHIAC collect some of the same information from hospitals on different reporting forms, though hospitals should only have to report such information once.) Implement a District Health Information System (DHIS) to support streamlined reporting on a more frequent basis and enhance the potential for use and analysis of data at the subnational level. (Again, HMN/WHO technical support is available for the District Health Information System.) All NHIAC regional offices have computers, but a technical needs assessment is needed for the rayons.
Data source: vital registration Vital registration is a crucial source of birth, death and cause-of-death information. Armenia has such a system in place, but it has not been modernized, lacking: 1. up-to-date training to ensure accurate cause-of-death certification, 2. systematic quality control to ensure full coverage and completeness in reporting births and deaths; and 3. adequate hardware and software to provide efficient, sufficiently detailed reporting.	To improve the quality of cause-of-death registration, conduct death certification training (for which a WHO online tool is available) and ensure that detailed causes are captured by using ICD-10 coding to at least 3 digits. Determine if facilities have been consistently applying the proper international definition of "live birth" since Armenia adopted it in 2005. Provide refresher training as needed. Conduct a full assessment of the vital registration system, including the quality of available hardware and software, to ensure full, effective coverage of birth and death reporting.

Situation	Policy recommendations
Data documentation and a central data repository The systematic sharing of data among institutions and with researchers can enhance health system transparency and accountability. In particular, an important way to improve health information systems to promote health system stewardship and performance is to increase the availability of existing data, so that it can be readily used for further analyses and for the development of evidence-based health policies. Doing so requires systemic data documentation and the archiving of meta- and microdata.	Document and archive routine and survey data according to international meta- and microdata standards (see the World Bank MicroData Management Toolkit at http://www.surveynetwork.org). Create a central repository to serve as home to all documented and archived electronic meta- and microdata.

3. DEVELOPMENT OF HUMAN RESOURCES FOR HEALTH

Delivering safe, quality health care services requires an adequate level of resources – including an adequate number of appropriately trained human resources. This chapter focuses on the Armenian health system's development of human resources for health, addressing the following two policy questions.

1. Is the health workforce sufficiently qualified, and its skill mix and geographical distribution adequate, to meet the health needs of the population?

2. Has retraining of the primary care workforce met the requirements established by primary health care reforms?

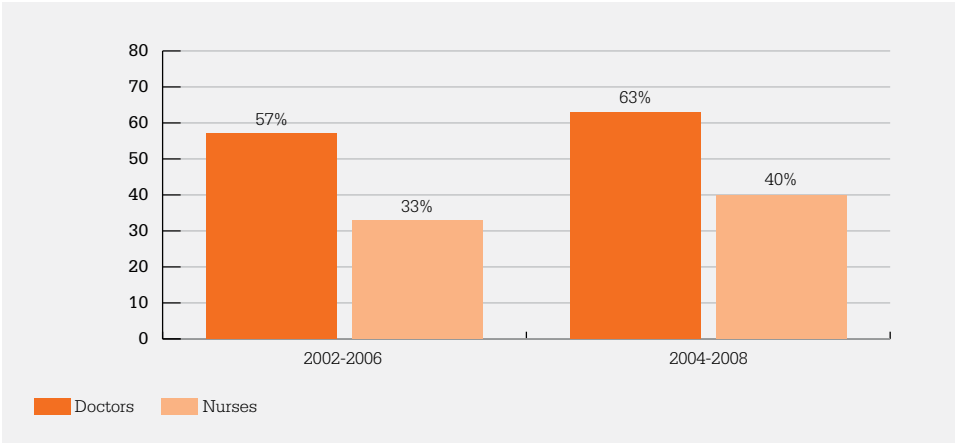
The performance of the health system has been assessed in these areas by examining training indicators and the number and mix of human health resources, particularly in the primary care sector.

Qualifications and magnitude of health human resources

Professional development of medical personnel

Existing regulations require that Armenian doctors and nurses take continuous education courses every five years. As of 2006, this standard had been met by 56.7% of the medical doctors and 32.5% of the nurses. Estimates for 2008 show an improvement for these indicators, with the percentage of doctors and nurses receiving such training within the previous five years being 62.6% and 40.0%, respectively (Fig. 3).

Fig. 3. Percentage of doctors and nurses who took continuing education courses in a given 5-year period



Source: National Institute of Health.

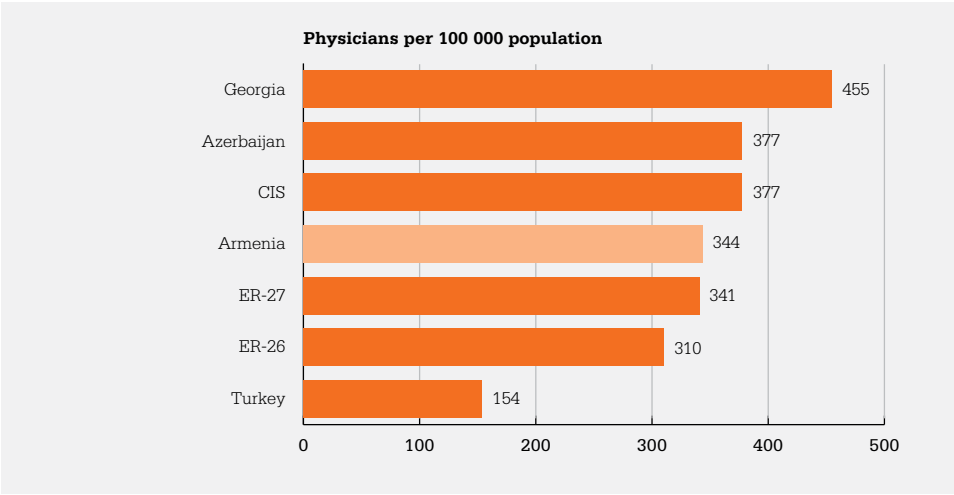
Nevertheless, the number of trained doctors and nurses remains well below existing standards. Training for doctors and nurses, including refresher training, is provided chiefly by the National Institute of Health, with a small part of the training occurring at the Yerevan State Medical University on a paid basis. Training may be paid for by the government, a health care facility or personal funds. Since the National Institute of Health appears to have sufficient capacity to train the required number of doctors and nurses, the gap in training may be due to a lack of funds.

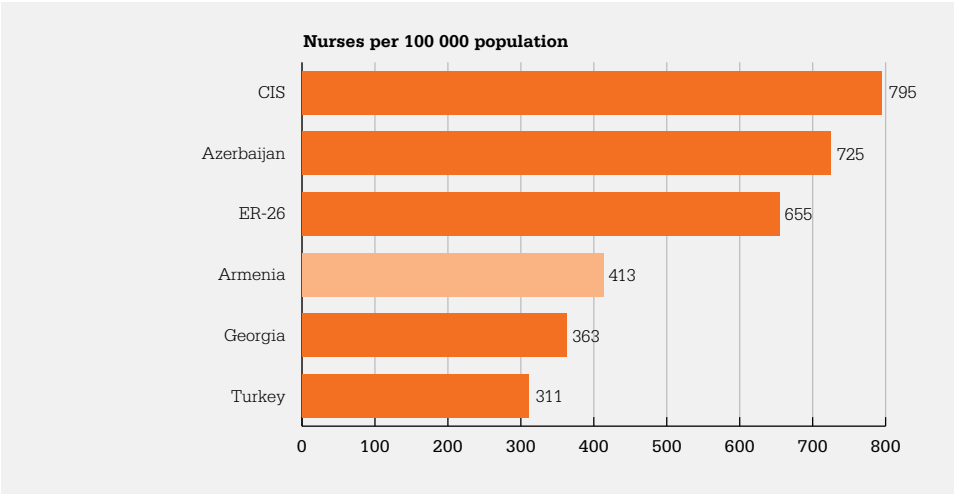
When assessing the training of medical personnel, it is important to assess the effectiveness of training as well as the numbers of staff trained. Indicators that might be used to assess the effectiveness of health care services – include testing and adherence to clinical guidelines, but they are not available at present. These indicators are among those that would be monitored in the Service Availability Mapping (SAM) activity recommended in the previous chapter.

Availability and mix of health human resources

Concentration of nurses and physicians. The number of nurses per 100 000 population is low in Armenia compared to the concentration in developed European countries (ER-27) and in the Commonwealth of Independent States (CIS) (see Figs 4 and 5). On the other hand, the ratio of physicians per 100 000 population is close to the average for the ER-27 and well below that of Georgia and Azerbaijan.

Figs 4, 5. Nurses and physicians per 100 000 population, selected countries and country groups, 2007

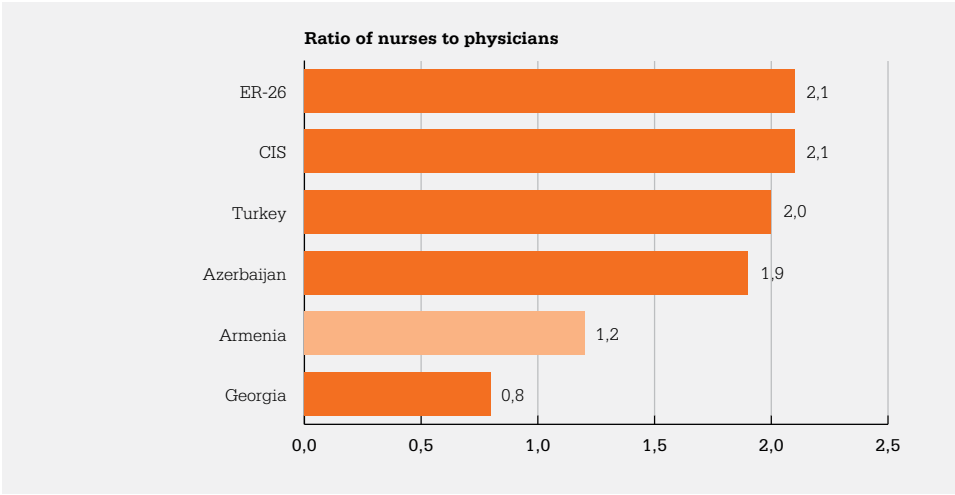




CIS: Commonwealth of Independent States; ER-26, ER-27: see description on p. 22.
Source: WHO Regional Office for Europe, 2009 *(9)*.

With the exception of Georgia, the nurse to physician ratio in Armenia is lower than in the other countries and country groups looked at (Fig. 6), reflecting the fact that during the optimization phase of the national health reforms, the relative reduction in nurses was higher than in physicians.

Fig. 6. Ratio of nurses to physicians, selected countries and country groups, 2007



CIS: Commonwealth of Independent States; ER-26: see description on p. 22.
Source: WHO Regional Office for Europe, 2009 *(9)*.

The education of medical personnel continues at a high rate. Specifically, the M Heratsi State Medical University graduated 1221 physicians in the period from 2006 to 2008, including 428 in 2008. The total number of graduates from all public and private tertiary medical institutions in 2008 was 756.

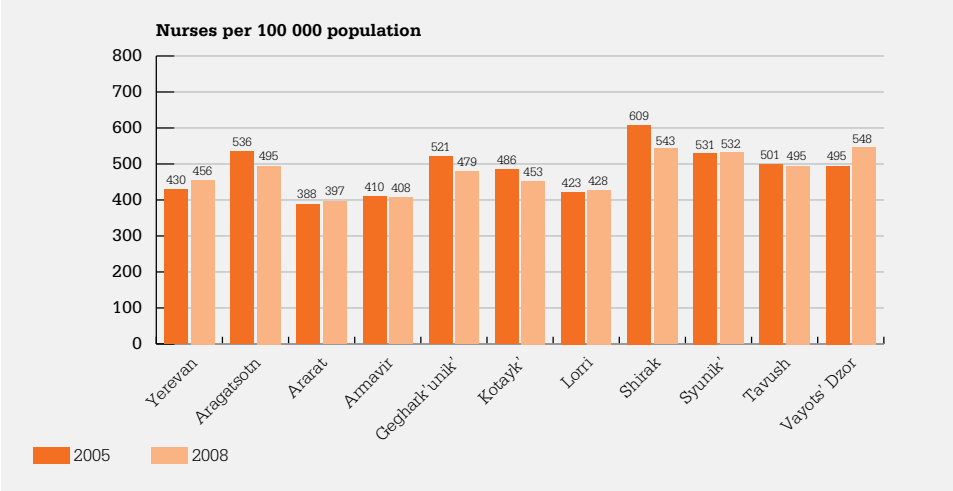
Education of nurses has also continued apace. In the same period (2006–2008), the state secondary vocational medical institutions had 6066 nursing graduates (3048 in 2008). The total number of nursing graduates from all secondary vocational medical institutions in 2008, both public and private, was 3412.

The concentration of nurses and physicians per population varies significantly by marz (see Figs 7 and 8)[5]. Although the overall concentration of physicians for Armenia is in line with that of other countries, it is quite low in many of the marzes, ranging in 2008 between 144 per 100 000 population in Geghark'unik' to 197 per 100 000 in Syunik' (excluding Yerevan). This range did not change significantly between 2005

5 The figures for Yerevan refer to the health care facilities of its municipal health department. The overall ratios for Yerevan have not been calculated because most of the hospitals there provide services to the entire population of Armenia.

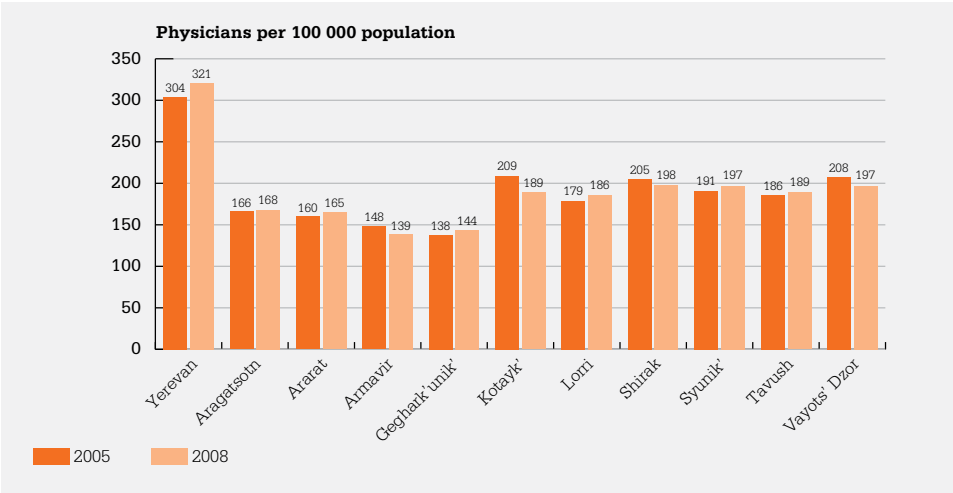
and 2008. The ratio of nurses to 100 000 population in 2008 varied from a low of 397 in Ararat to a high of 548 in Vayots' Dzor.

Fig. 7. Nurses per 100 000 population in Yerevan and the marzes, 2005 and 2008



Source: NIAC.

Fig. 8. Physicians per 100 000 population in Yerevan and the marzes, 2005 and 2008



Source: NHIAC.

Human resources for primary health care

Four indicators have been reviewed to assess the size and mix of the primary health care workforce:

1. the ratio of primary care physicians to "narrow" specialists;

2. the ratio of nurses to physicians in primary care settings;

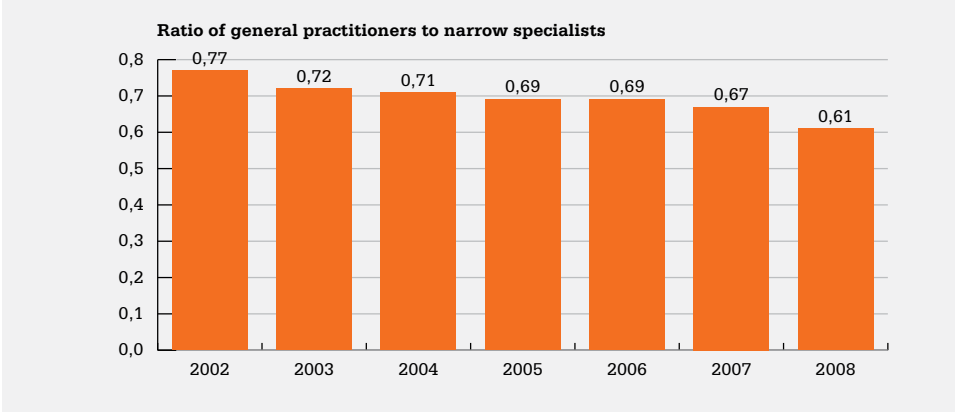
3. the percentage of active family doctors who are general practitioners; and

4. progress in retraining family doctors and nurses in primary health care.

Mix of the primary care workforce

Primary care physicians and specialists. The ratio of active general practitioners to narrow specialists in primary health care settings decreased between 2002 and 2008 (Fig. 9), when one of the main goals of the Primary Health Care Strategy for 2008–2013 *(14)* has been to increase this ratio.

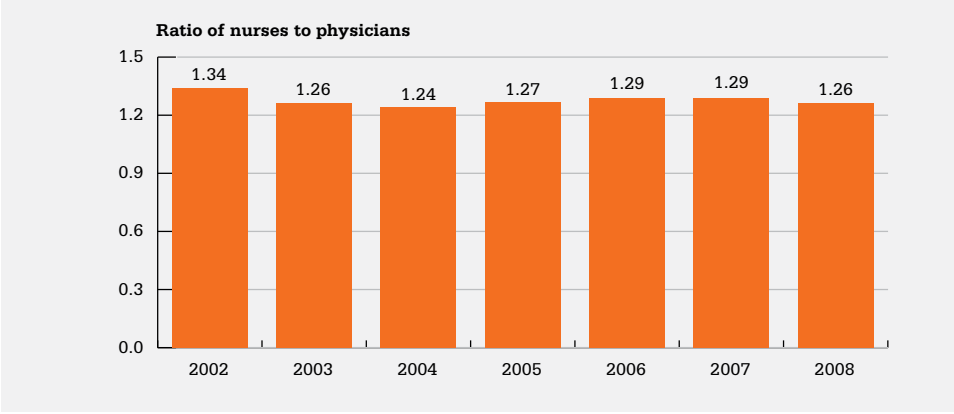
Fig. 9. Ratio of active general practitioners (district physician, paediatricians and family doctors) to active narrow specialists in primary care settings, 2002–2008



Source: NHIAC.

Ratio of nurses to physicians in primary health care settings. The ratio of active nurses to all active physicians in primary care settings has remained relatively consistent over the same time period (Fig. 10).

Fig. 10. Ratio of active nurses to active physicians in primary care settings, 2002–2008

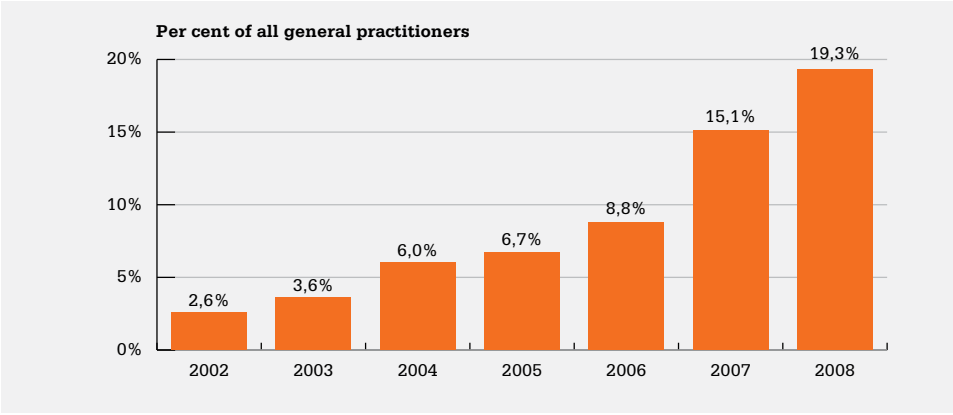


Source: NHIAC.

Active family doctors and progress in retraining

The Primary Health Care Strategy for 2003–2008 states that the country requires between 1500 and 2000 family doctors, assuming that the standard for a family doctor's optimal workload is 1500–2000 patients. The target for 2008 was to have 900 active family doctors *(15)*. Although the number of family doctors has been increasing over the past five years and training has been proceeding apace (with a cumulative total of 844 family doctors retrained at the end of 2008 (see Fig. 12 below), the number that was actively practicing family medicine in 2008 was only 354 in 2008 and is significantly below the target (see Table B9 in Annex B). However, the percentage of family doctors among active general practitioners – an indicator showing progress towards the target mix of primary care practitioners – has been increasing steadily since 2003, particularly in 2007 and 2008, and it now stands at 19.3% (Fig. 11).

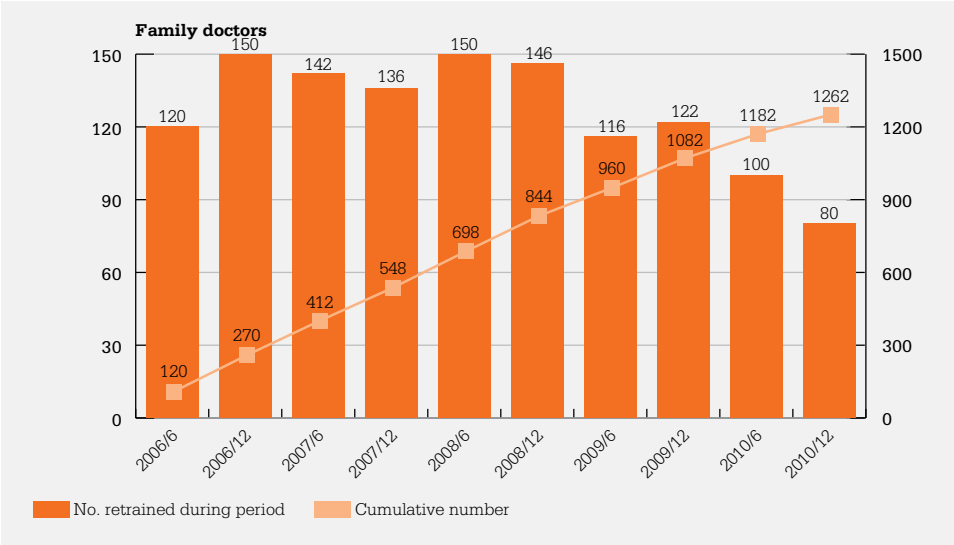
Fig. 11. Family doctors as a percentage of all active general practitioners, 2002–2008

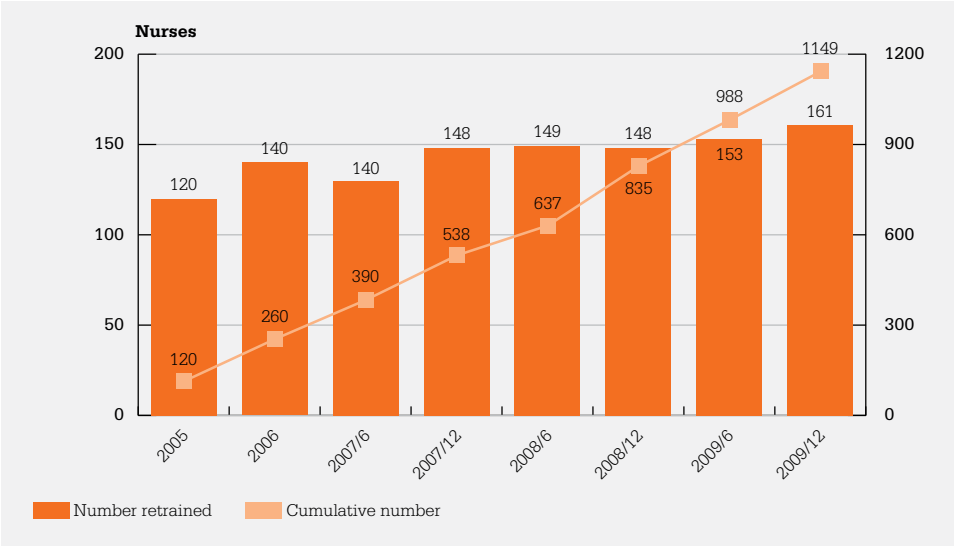


Source: NHIAC.

As noted above, the retraining of family doctors and nurses, which has been financed by the World Bank through the Health System Modernization Project, has proceeded rapidly. By the end of 2010, it is expected that 1262 family doctors and 1149 family nurses will have been retrained over the 5-year period beginning in 2006 (Figs 12 and 13).

Figs 12, 13. Numbers of family doctors and nurses retrained, per period and cumulatively, 2006–2010 (observed and projected)





Note: each 6-month period ends with the month indicated.
Source: National Institute of Health.

The Primary Health Care Strategy for 2008–2013 *(13)* describes the factors that have impeded the increase in the number of active family physicians.

> Though the introduction of the family healthcare institute in the rural health sector may be considered as accomplished, in the urban polyclinics it is not yet completed, because retrained family physicians do not have an opportunity to carry out the full range of functions outlined in their job description. The main reason is the existence of narrow specialized services in the urban polyclinics that definitely exceed (especially in Yerevan) the quotas established for relevant specialists per number of population … In terms of healthcare management policy, the directors in polyclinics are not motivated to encourage the establishment of independent practices … Under the existing system, the PHC [primary health care] medical personnel have no input in such issues as staff related decision-making, income and expenditure control, or setting of priorities for medical services.

So, although sufficient numbers of family doctors are being retrained, in urban areas the organization of service delivery has not encourage the utilization of their professional services. The 2008–2013 strategy document *(16)* outlines steps that would help to address this situation, as follows.

For establishment of independent Family Medicine practices it is necessary to:

- Improve legislative and regulatory mechanisms;
- Develop mechanisms for fair financial compensation;
- Develop guidelines related to the establishment of independent practices through various business forms and procedures for state registration;
- Develop and implement the educational programmes for family doctors to enhance knowledge and practice of general management, financial management, and business tax laws.

Health information limitations and gaps

The number of physicians defined as "active" may not be completely accurate. To the extent that some physicians do not work full time in clinical practice – e.g. because they have teaching or administrative responsibilities – the number of active physicians may overstate physician availability.

Summary of findings and policy recommendations

Table 4. Findings and policy recommendations: developing human resources for health

Situation	Policy recommendations
There are formal requirements for continuous medical training, but the number of medical professionals who receive it is below requirements. There is no evaluation of training programmes or any other process to determine what impact they have.	Consider incentives and/or enforcement mechanisms to encourage participation in continuing medical education. Consider monitoring quality indicators, such as adherence to clinical practice guidelines.
Retraining of family physicians is proceeding according to strategy. However, the number of active family physicians is still well below the targeted numbers.	Clarify the primary health care service delivery model, particularly in urban polyclinics, to encourage family physicians to exercise the full scope of their responsibilities.
The mix of medical personnel, particularly the ratio of general practitioners to narrow specialists and to nurses, appears unbalanced. Although the total number of physicians is not out of line when international comparisons are made, there are likely too many narrow specialists in Armenia. The number of nurses is relatively low in comparison to other countries, and also in comparison to the number of physicians. The distribution of nurses and physicians among the marzes is unbalanced.	Develop a workforce plan for the number and geographical distribution of medical specialists and nurses. Develop necessary incentives and/or enforcement mechanisms to implement this plan, particularly with respect to the training of new doctors and specialists.

4. EQUITY IN FINANCING AND FINANCIAL PROTECTION

The Republic of Armenia, like other countries of the WHO European Region, faces difficult challenges and choices in financing its health system. New medicines and other technological developments, rising expectations and an ageing population fuel increased demand and put upward pressure on system costs. The combination of upward pressure on costs and limitations on the ability of governments to increase spending forces countries to consider reforming the way they finance their health systems. During 2009, for example, the Armenian dram was forced to float as a result of the financial crisis, leading to immediate increases in the costs of import goods, including medicines. While the impact of this external shock is not captured in this report, it illustrates the type of challenges facing governments.

In 2005 the Member States of the European Region, including Armenia, endorsed the core values of solidarity, equity and transparency as part of a WHO Health For All update *(17)*. These values direct the common goals of health financing policies, goals that the Member States endorsed in 2006 *(18)* and confirmed again recently by signing the Tallinn Charter *(1)*.

In the context of the European Region, the goals of health financing policies are as follows.

- *Protection against the financial risk of ill health, or financial protection*. People should not become poor as a result of using health care, nor should they be forced to choose between their physical (and mental) health and their economic well-being *(1)*.

- *Equity in financing*. Relative to their capacity to pay, the poor should not pay more for health care than the rich. This goal is closely linked to the core value of solidarity.

- *Equity in utilization*. Health services and resources should be distributed according to need, not according to other factors such as people's ability to pay for services.

- *Improving transparency and accountability to the population*. The population's entitlements and obligations should be understood well by all, reflecting a promise by the state to its citizens.

- *Health service quality and efficiency*. Financing arrangements should reward good-quality care and provide incentives for efficiency in the organization and delivery of health services.

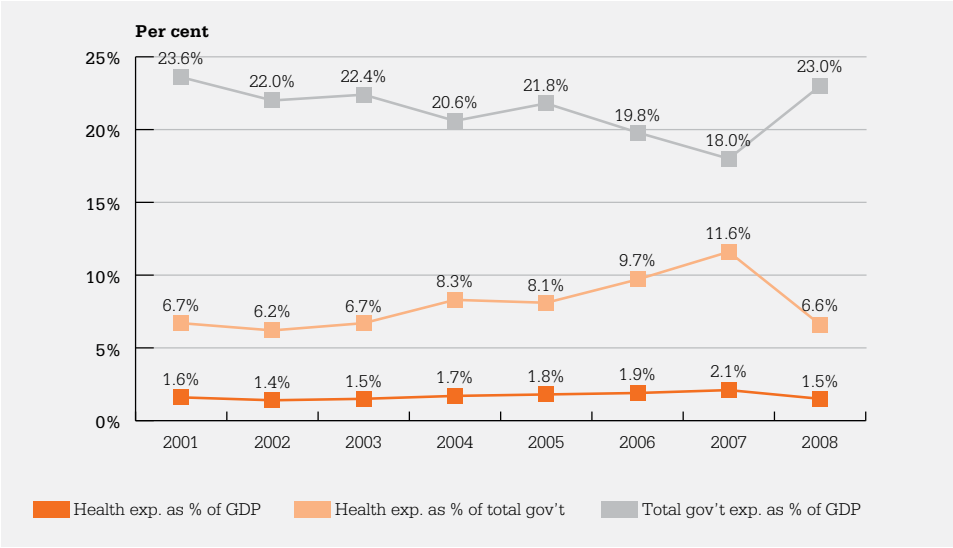
- *Administrative efficiency*. Minimizing the duplication of functional responsibility for administering the health financing system promotes administrative efficiency.

This chapter will not assess the performance of the Armenian financing system with regards to all the health-financing policy objectives noted above. Instead, it will focus on two core health-financing objectives that are directly related to the ultimate goals of the health system: protection against the financial risk of ill health, and equity in financing. (See also Chapter 6, on access to health care, which deals with the issue of equity in utilization, as far as available data permit.) In order to better understand the context in which Armenia has made progress in the last year towards these objectives, a preliminary section presents the fiscal context and the priority that the government assigns to health. This prioritization of health has been sustained since 2002, even in the midst of the current financial and economic crisis.

Fiscal context and prioritization of health

Armenia has had a noteworthy health expenditure history in recent years, showing a sustained increase in the share of total public spending it has allocated to health since 2002. The government health spending as a percentage of GDP has shown an increase since 2002. Remarkably enough, it was entirely due to the Government of Armenia's rapid prioritization of health in public resource allocation, even as the overall fiscal constraint in the country (i.e. total public spending as a percentage of GDP) tightened from 22% in 2002 to 18% in 2007. Indeed, government health spending as a share of GDP rose from 1.4% to 2.1% over this period. Between 2002 and 2007, the increase in government health spending has accordingly outpaced the growth in both the GDP and overall government spending. During this period, spending on health care as a percentage of total government spending increased from 6.7% to 11.6% (Fig. 14), while as a percentage of GDP it increased from 1.4% to 2.1%. However, this trend was abruptly reversed in 2008 due to the consequences of the financial and economic crisis on the country. Data from the National Health Accounts (NHA) show that although GDP and total government spending both increased in absolute terms in 2008, public expenditures on health fell significantly from AMD 66 billion to AMD 53 billion (not adjusted for inflation; 1 billion drams was about 1.75 million euros in November 2009). These results should be reviewed to determine whether the expenditure reporting is consistent with previous years.

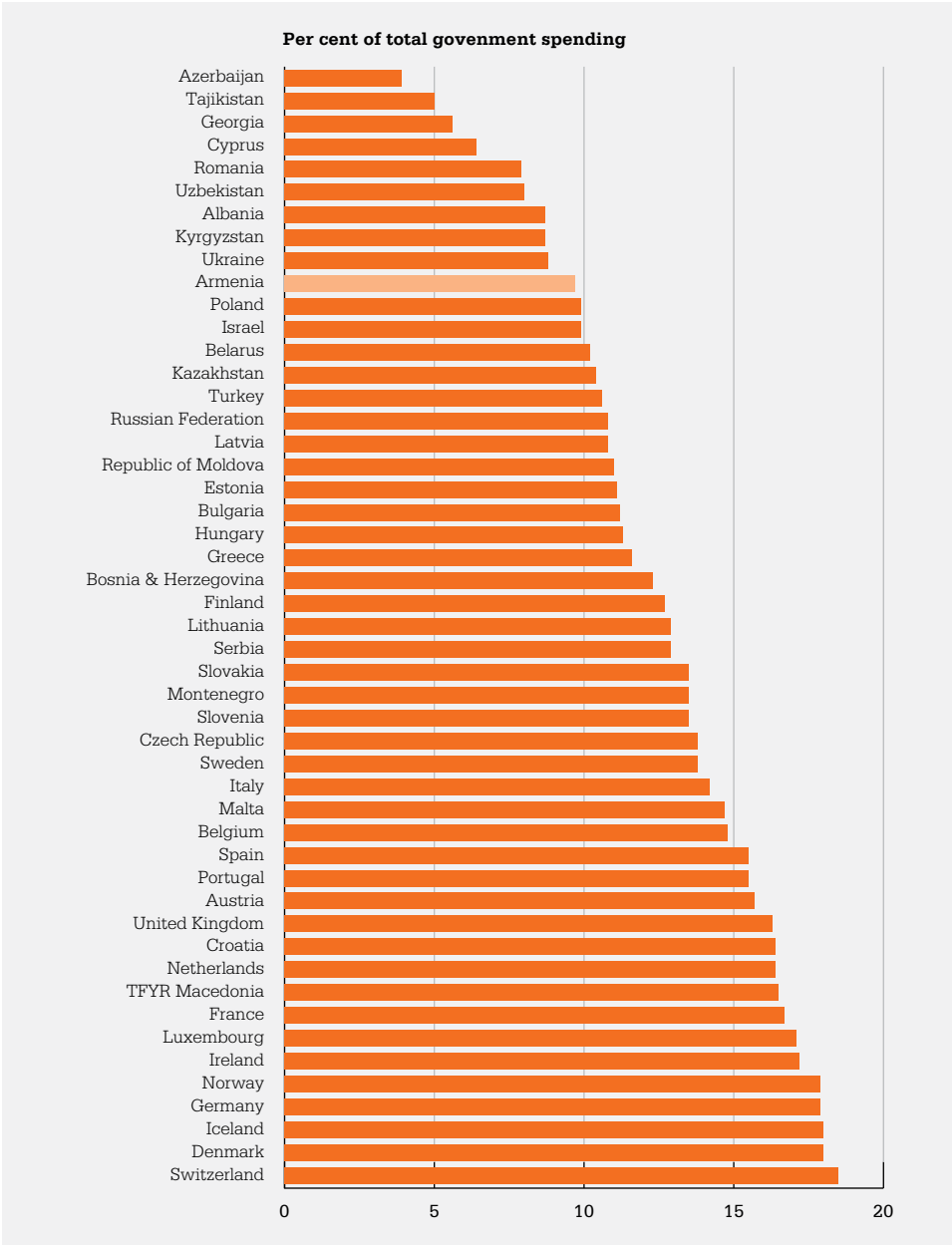
Fig. 14. Government expenditures, health expenditures and GDP, 2001–2008



GDP: gross domestic product.
Source: Armenia Ministry of Health.

The high priority that the Government of Armenia assigned to health over the last seven years is reflected in Fig. 15, which presents international comparisons for 2006 on health as a percentage of total government spending. Armenia stands out notably compared to other countries of the south Caucasus region, even though the fiscal situation of these countries had improved substantially more than Armenia's. This effort by Armenia is consistent with the commitment that the Member States of the European Region made to invest in their health systems *(1)*.

Fig. 15. Government expenditures on health as a percentage of total government expenditures, European Region Member States, 2006



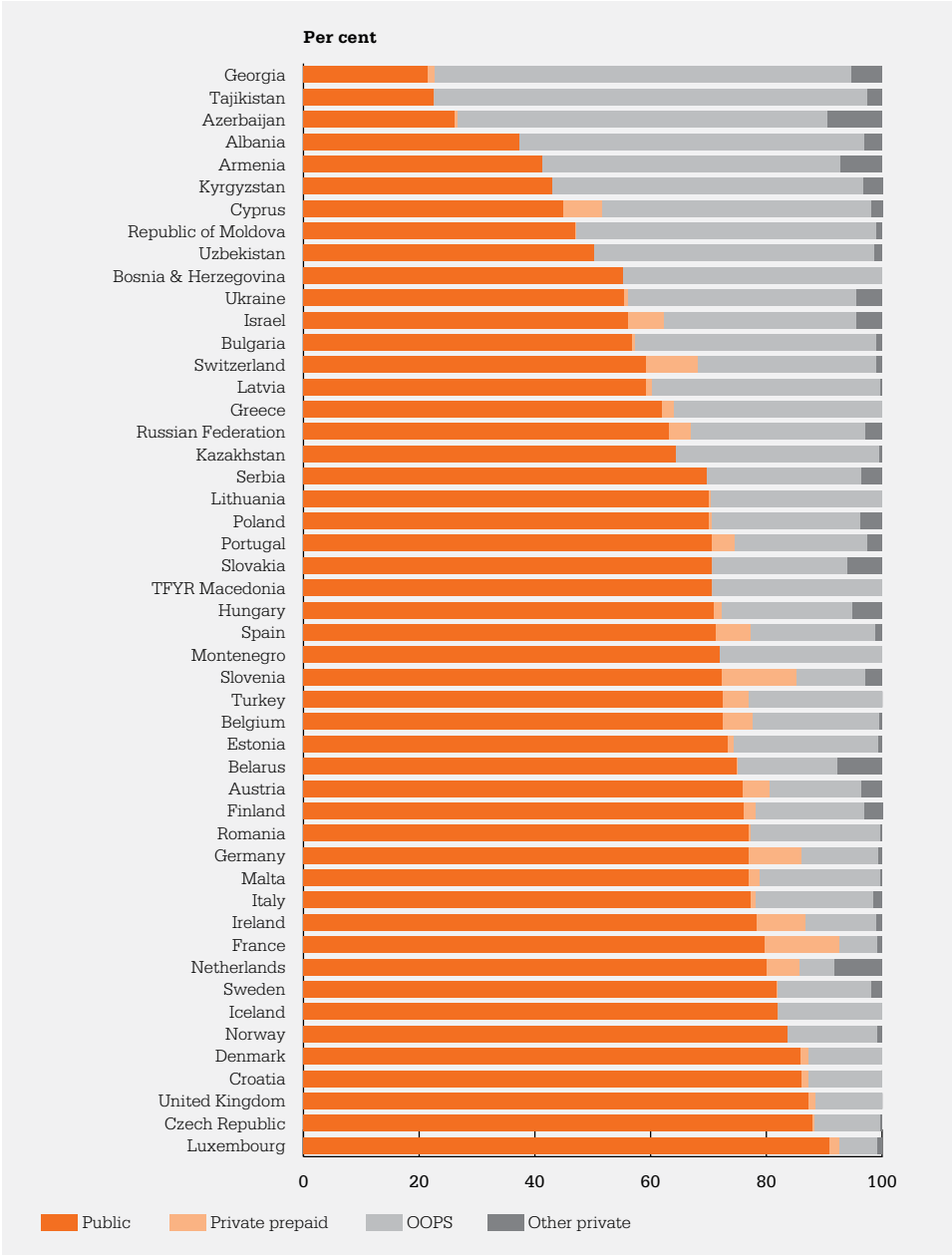
TFYR Macedonia: The former Yugoslav Republic of Macedonia.

Equity in health financing and financial protection

Equity in finance

An analysis of equity in finance should be comprehensive, reviewing all sources of health spending and tracing them back to the households from which they originated, both directly in the form of out-of-pocket payments and health insurance prepayments (whether voluntary or compulsory), and indirectly in the form of general taxation. A full analysis of equity in finance requires identifying the various sources of health system funds, analysing their distributional impact (i.e. who pays) and aggregating them by their relative contribution to total health system funding. International evidence *(19)* strongly suggests that compulsory prepaid sources (general taxation and payroll contributions for compulsory health insurance) tend to be more equitable, while voluntary prepaid sources (voluntary health insurance) are less equitable, and out-of-pocket payments are the most inequitable. The international comparisons from 2006 presented in Fig. 16 show that in Armenia, a larger share of health expenditure comes from public sources than in the other countries of the south Caucasus. However, Fig. 16 also shows that the share of health funding that comes from out-of-pocket payments, the most inequitable source of payments, is still quite high, accounting for more than 50% of total funds in 2006.

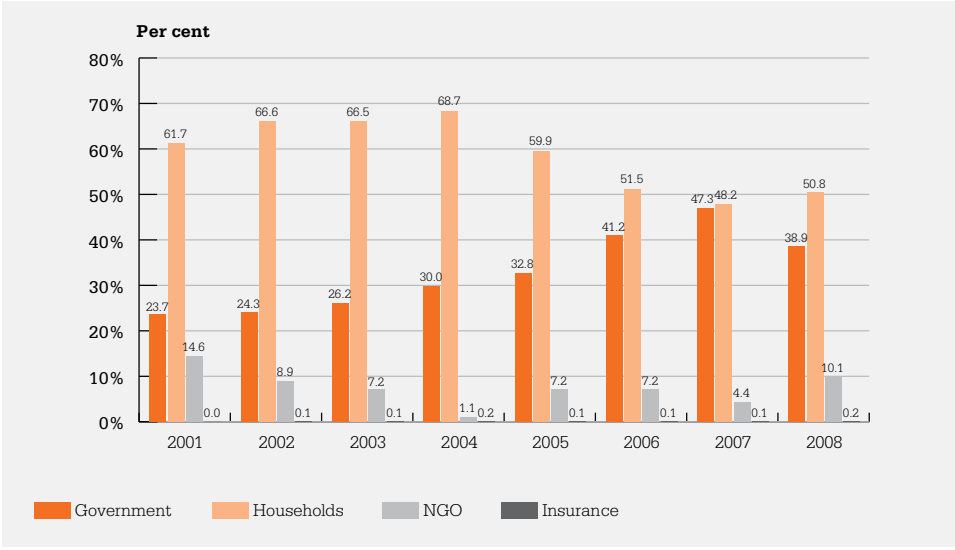
Fig. 16. Relative proportion of types of health funding in the WHO European Region, 2006



OOPS: out-of-pocket spending, TFYR Macedonia: The former Yugoslav Republic of Macedonia.

A more detailed analysis of the data for Armenia between 2002 and 2008 shows the contributions of various sources of financing to the health system: public financing, direct household expenditures, NGO contributions and insurance financing. The contribution of direct expenditures by households is significant. Between 2001 and 2007, total health expenditure increased from AMD 79 billion to AMD 139 billion. In absolute terms, the average annual growth was AMD 10 billion. Although they increased in absolute terms, household expenditures as a share of total health spending decreased from a high of 68.7% in 2004 to 48.2% in 2007 (Fig. 17). In essence, since 2004 the overall increase in health spending has been financed through the government budget. However, as noted in the previous discussion, government health spending decreased in 2008 from the previous year, while household health expenditures increased by AMD 2.6 billion. As a result, household health expenditure increased as a percentage of total health expenditure, rising from 48.2% in 2007 to over 50%, though still below the share of more than 60% that households contributed prior to 2005.

Fig. 17. Health expenditures by source as a percentage of total health expenditures, 2001–2008



Source: NHA.

Financial protection

This issue concerns one of the most direct associations between health and welfare: the extent to which people become impoverished by health expenditures, or conversely,

the effectiveness of the health financing system in protecting people from the risk of becoming poor while enabling them to use health services. Standard measures of this objective exist *(20),* and they can be generated for any country that has reliable household survey data on:

- the percentage of households experiencing "catastrophic" health expenditures (health spending that exceeds a certain threshold percentage of total or subsistence household spending); and

- impoverishing health expenditures, measured as the impact of health spending on either the "poverty headcount" (the number or percentage of households that fall below the nationally defined poverty line as a consequence of their health spending) or the "poverty gap" (extent to which households fall below the poverty line as a consequence of their health spending).

These indicators can be stratified by income quintile to provide information about the degree of equity for financial protection.

Unfortunately, there are limited data available for these performance indicators. Results from the National Statistics Service (NSS) survey, the 2006 Household Health Expenditures survey, show that on average Armenians spend approximately 12.3% of their reported income on health care services *(21)*. However, the households in the poorest wealth quintile spend on average more than twice as much of their income (26.2%) for health care (see Table B11 in Annex B). By comparison, households in the richest quintile report spending on average only 5% of their income on health care, while the other three quintiles report spending between 9% and 11%. The 2006 survey also shows that 16% of Armenian households were incurring catastrophic medical expenses (health expenses exceeding 40% of all non-food expenditures).

However, even without an in-depth analysis of survey data to determine the catastrophic and impoverishing effects of health spending and to establish trends, international evidence strongly suggests that high levels of out-of-pocket spending is cause for concern. An analysis undertaken by WHO of data from nearly 80 countries *(22)* reveals a strong correlation between the share of out-of-pocket payments in overall health spending and the percentage of families facing catastrophic health spending. Despite a reduction in the level of out-of-pocket payments in overall health care finances, Armenia still had one of the highest levels in the European Region in 2007 and 2008, at around 50%. That suggests that the number of Armenian families who have large health payments in comparison to their capacity to pay, or who have catastrophic

health expenditures, is high. Given the evidence of significant informal out-of-pocket payments in Armenia, as shown above in Figs 16 and 17, and the anticipated policy changes with respect to health care payments, it is imperative that values for these indicators be determined in order to assess the present situation and establish a baseline prior to the implementation of new policy measures. A consistent survey methodology is required to track changes in these measures over time.

Currently, eligibility for the government-funded basic benefit package is based on 22 defined population groups. They include, for example, people at three different levels of disability, children of parents with a disability, and children in single-parent families. (For a full list, see Table B10 in Annex B.) It has been estimated that of the more than 162 000 individuals in the three disability categories, only approximately 15% are registered for poverty benefits, i.e. the remainder are not poor. While these figures require further verification and analysis, they do suggest that designing a government benefit package that is more targeted to the poor should be seriously considered. The Family Benefit Programme uses a proxy means test to assess household eligibility, which might provide a national database to use in reallocating subsidies for health care services.

Health information limitations and gaps

- The reported government expenditures on health care from the 2008 National Health Accounts (NHA) appear to be inconsistent with previous trends. These results should be reviewed to determine whether the way they were classified and reported is consistent with the handling of previous years' data, and the interpretation of the results should be adjusted as appropriate.

- There is currently no reliable estimate of household expenditures on health care as a percentage of all household expenditures. This figure could be generated from the Integrated Living Conditions Survey to provide a baseline result for this indicator, which could be updated annually.

Summary of findings and policy recommendations

Table 5. Findings and policy recommendations: fair financing and financial protection

Situation	Policy recommendations
Public financing of the Armenian health system has increased in relative terms in recent years. All things being equal, it should lead to a more equitable distribution of the burden of financing health care. However, government expenditures on health care as a percentage of GDP remain low, and international comparisons suggest that further increases should be made. The current approach to health financing in Armenia has several positive aspects, in particular the existence of the State Health Agency, which is responsible for using tax revenues to purchase a basic benefit package from what in most cases are independently manage health service providers.	Continue increasing government spending on health despite fiscal constraints. Support the current reform process to reduce informal payments for health care, and improve financial protection for the population. Work carefully to synchronize the following: 1. reform of the content of the tax-funded basic benefit package; 2. the groups defined as eligible for subsidized health services; 3. the prices paid by the State Health Agency; and 4. the introduction of a new co-payment. Continue to strengthen strategic purchasing and to improve the balance between creating appropriate financial incentives and accounting controls *(23)*.
It has proven difficult to establish indicators measuring household expenditures on health, including informal spending. Evidence suggests there is a significant level of informal payments that are made to service providers in Armenia. Household out-of-pocket expenditure as a share of total health expenditure has declined from over 60% prior to 2005 to approximately 50% in 2008, but it is still one of the highest in the European Region.	Proceed in developing and implementing policies to address informal and other out-of-pocket payments for health care services. Although it is one of the biggest problems facing Armenia's health sector, it cannot be solved in isolation; consider therefore a package of policies to address the interconnected problems. Ensure that there is a good system of indicators to monitor the implementation of these policies and assess their impact on access to health care services *(24)*.

5. HEALTH SYSTEM EFFICIENCY

A more efficient health system, other things being equal, is one that delivers more effective and appropriate care to the population for a comparable level of resources. The allocation of resources to different parts of the health system, the appropriateness of health care interventions and the cost of delivering the interventions all have an impact on health system efficiency.

The overriding policy question that needs to be answered is wether health system resources are used productively to deliver better health outcomes to the people of Armenia?

With respect to reforms currently underway in Armenia to address the allocation of health care resources, there are two additional policy questions that are related to health system efficiency.

1. What progress has been made in implementing a health system that is based on primary health care?

2. What progress has been made in optimizing the hospital network in Yerevan and the marzes?

Effectiveness in using health system resources

There are two measures available to assess the general effectiveness of the way in which health system resources are used to improve the health of the population. The first measure available is the allocation of resources to primary health care in comparison to hospital care. Multicountry studies show that the strength of a country's primary care system is associated with improved population health outcomes for all-cause mortality, all-cause premature mortality, and cause-specific premature mortality from major respiratory and cardiovascular diseases *(25)*. The second measure is the extent to which resources are spent on direct treatment (i.e. salaries of health care providers, supplies and drugs, etc.) rather than administration.

The two indicators, then, are:

1. the allocation of government health expenditures to primary health care and hospital care; and

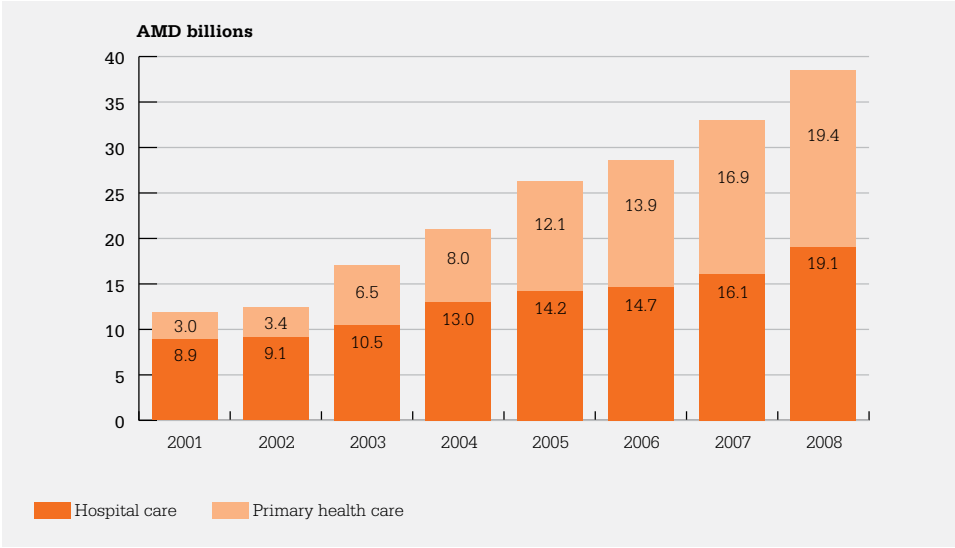
2. the structure of hospital and primary health care spending on employee salaries, supplies, drugs and other expenses.

Allocation of government expenditures to the primary health care and hospital sectors

In the Primary Health Care Strategy 2003–2008, the target for the ratio of government spending on the primary health care sector to its spending on the hospital sector is 60:40. Government expenditures in both sectors have grown significantly, increasing from a total of approximately 12 billion drams in 2001 to 38.5 billion drams in 2008 (Fig. 18). However, the growth in spending on primary health care has been especially rapid, increasing more than sixfold over this time period, reaching the point in 2008 where government expenditures on primary health care and on hospitals were essentially equal.

Note that the expenditures reported for primary health care also include spending on polyclinics.

Fig. 18. Total government expenditures on health by sector, in billions of drams, 2001–2008



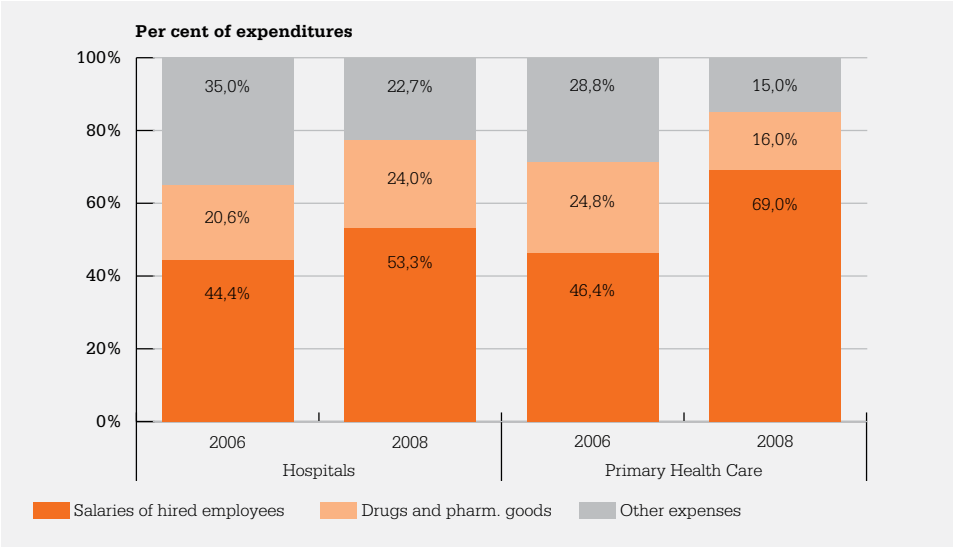
Source: Ministry of Health.

In order to ensure that spending on primary health care is effective, it is important that service delivery is clarified and that there are appropriate policies and regulations or incentives in place to guarantee the quality and range of primary health care services *(5)*.

Structure of primary health care and hospital expenditures

Low physicians' salaries in hospitals have been identified as one of the factors leading to shortcomings in the performance of the hospital sector *(5)*. As shown in Fig. 19, medical staff salaries as a percentage of total health expenditures increased between 2006 and 2008 for both the hospital and the primary health care sectors. Over the same period, both sectors saw the share of "other" expenses decrease. These results suggest that the share of health expenditures devoted to patient care has increased recently as reforms have been implemented in both sectors.

Fig. 19. Health care expenditures by type of expenditure and sector, 2006 and 2008



Source: NHA.

Implementation of primary health care reforms

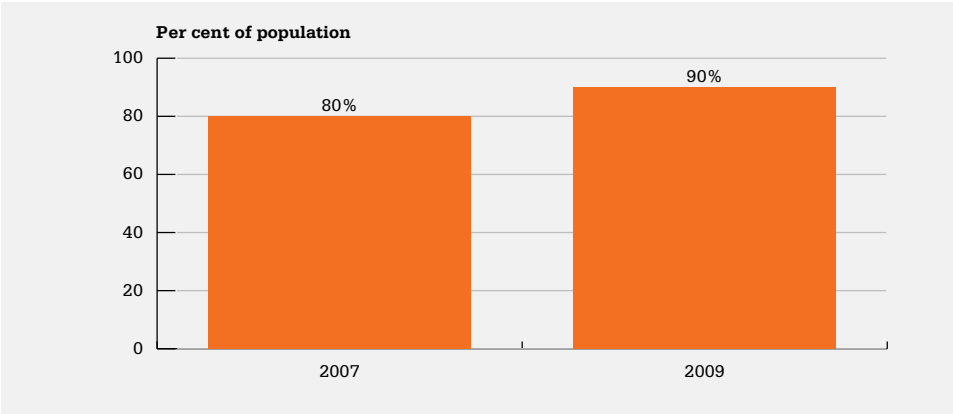
As discussed above, government expenditures in primary health care have grown significantly over the past six years as the government has implemented reforms. The focus of the reforms has included retraining physicians to be family doctors and reorganizing the system of narrow specialists in polyclinics. Given these strategies, several indicators can be used to assess the implementation and effectiveness of primary health care reforms:

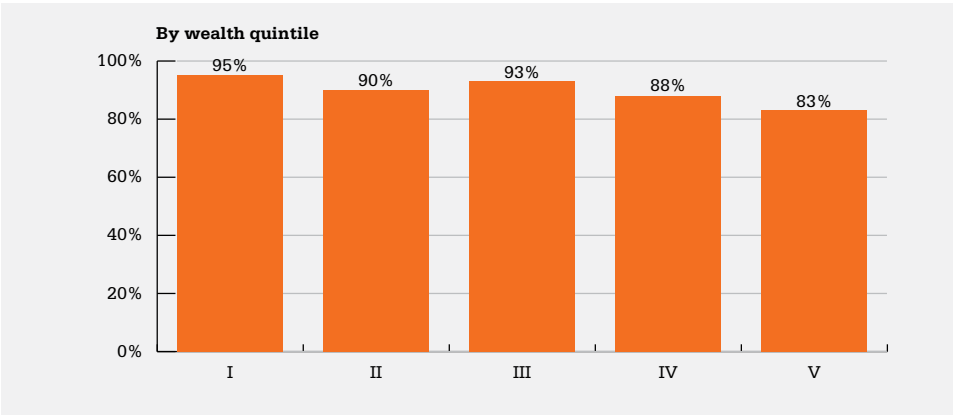
- the percentage of the population who report they usually visit a primary care facility when they need care, along with a breakdown by type of primary care facility last visited;
- patterns in hospital referrals for non-emergency conditions; and
- the frequency of preventive visits by primary care providers.

The kind of provider people usually consult

Coincident with the reforms in primary health care, Armenians who need care are choosing to seek it in primary care facilities more often. Results from the 2007 and 2009 HSPA surveys show that the percentage of respondents who answered that they "usually" visit a primary care unit when they need care increased from 79.6% to 89.6% (Fig. 20). This change is in line with the steady increase in visits to primary care facilities, which have grown from 1.8 per capita in 2001 to 3.3 in 2008.

Figs 20, 21. Percentage of population who "usually" visit a primary health care unit when care is needed, 2007 and 2009 and by wealth quintile





Sources: HSPA 2007 and 2009.

Fig. 21 shows some differences in utilization of primary health care services by wealth quintile, ranging from a high of 95% of the respondents in the poorest quintile (I) indicating they would usually visit a primary health care unit if they needed care, to a low of 83% of the respondents in the richest quintile (V) indicating the same.

In addition, there have also been changes in the type of primary care facilities visited between 2007 and 2009 as health centre facilities expanded. The percentage of respondents who reported that their last primary health care visit was to a health centre increased significantly in all three major geographic settings – Yerevan, other urban areas, and rural areas (Table 6). This increase has come primarily at the expense of

medical station visits in rural areas and polyclinics in urban settings. This changing pattern suggests that a significant segment of the population has started to utilize the paid primary care services in health centres, preferring them, even when they involve additional cost,[6] to polyclinics.

Table 6. Primary health care visits, by type of facility and of geographical area, 2007 and 2009

	2007			2009		
	Yerevan	Other urban	Rural	Yerevan	Other urban	Rural
Medical station	5.1%	5.1%	28.7%	2.1%	3.5%	10.4%
Ambulatory	0.0%	0.6%	30.5%	1.0%	0.0%	34.0%
Health centre	3.4%	0.0%	7.8%	21.6%	14.2%	30.2%
Polyclinic	91.5%	94.3%	32.9%	70.1%	74.3%	24.5%
Family practice	0.0%	0.0%	0.0%	5.2%	8.0%	0.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

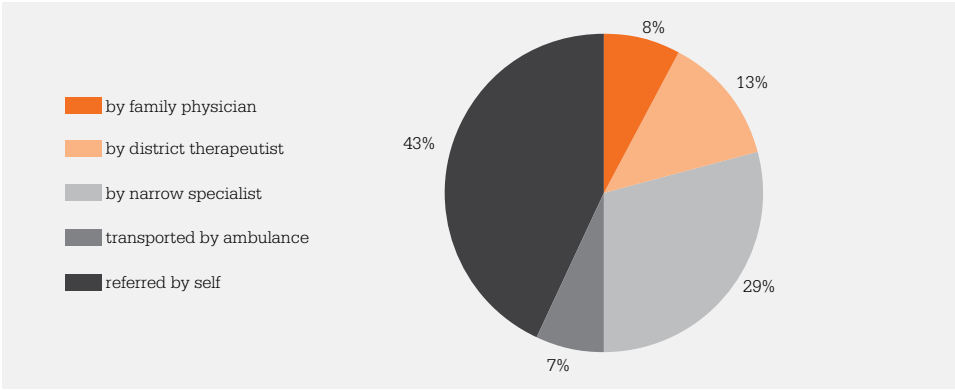
Sources: HSPA 2007 and 2009.

Referrals to hospitals for non-emergency conditions

A significant segment of the population refer themselves to hospitals for non-emergency conditions. Results from the 2009 HSPA survey show that 42.8% of referrals to hospitals are made by individuals, with the next largest segment (29.1%) referred by narrow specialists (Fig. 22). Family and district physicians together account for just over 20% of hospital referrals. Survey questions related to hospital referrals were not included in the 2007 survey, so a comparison with previous results is not possible. However, this indicator should be monitored in the future to determine if the rate of self-referral is decreasing and the rate of referrals from family physicians is increasing. Such developments would indicate more appropriate use of both primary care and hospital facilities.

6 Health centres in Yerevan are private facilities. They may be either public or private facilities in other urban areas, and they are strictly state facilities in rural areas. Patients accordingly pay out of pocket for visits to all health centres in Yerevan, and for visits to some health centres in other urban areas.

Fig. 22. Hospital visits by source of referral, 2009

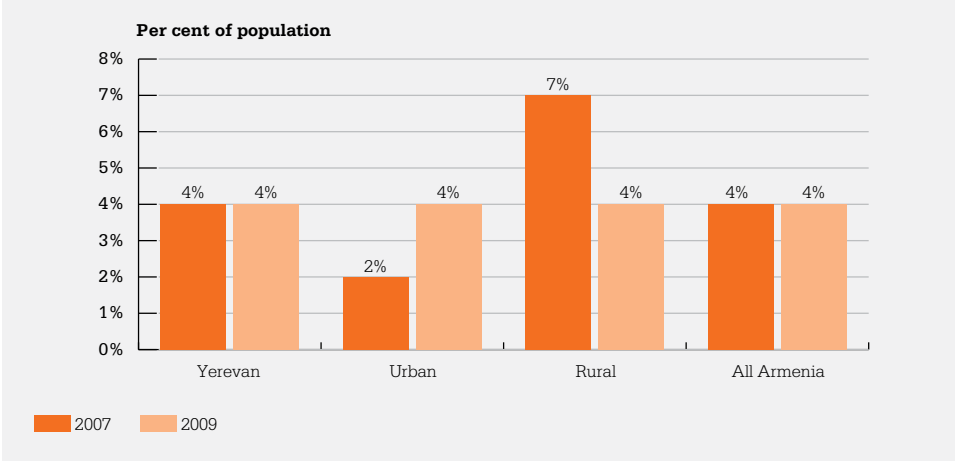


Source: HSPA 2009.

Rate of preventive visits

The responsibilities of a district physician include an annual preventive visit to the individuals in his or her district. This arrangement is important for the prevention and early detection of diseases, and it enables the district physician to reinforce messages about the importance of healthy behaviours, especially given the high prevalence of smoking and overweight conditions in Armenia. Results from both the 2007 and 2009 HSPA surveys, however, found that respondents reported a very low level of preventive visits by district physicians – 4.4% in 2007 and 3.9% in 2009 (Fig. 23).

Fig. 23. Percentage of adults reporting a preventive visit by a medical professional, total and by residence, 2007 and 2009



Sources: HSPA 2007 and 2009.

Progress of hospital sector optimization

The final area of health system efficiency concerns the optimization of hospital facilities. Optimization was undertaken to reduce excess capacity, as many hospitals in the marzes were not utilizing their full capacity, and the maintenance costs and unused resources added to the overall health care costs.

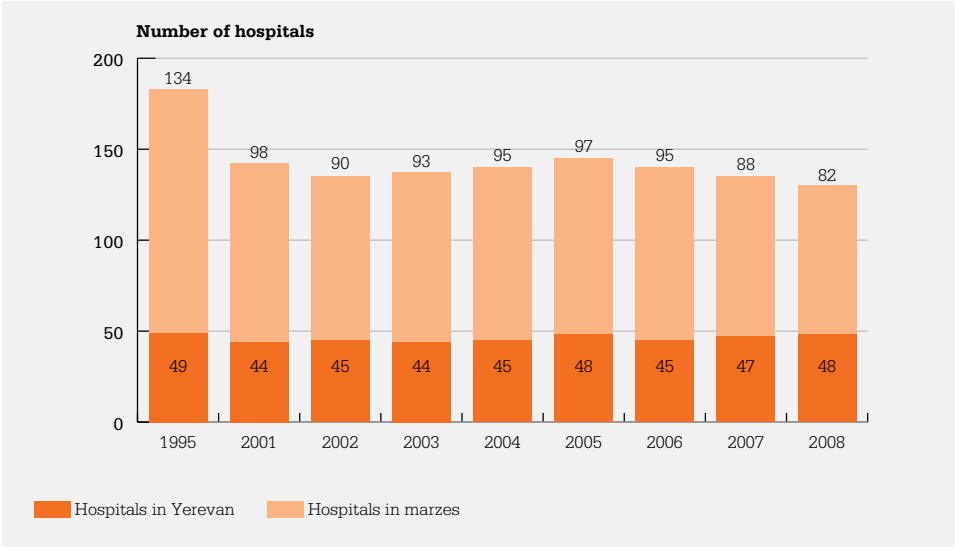
Progress towards the hospital optimization goals can be assessed by examining several indicators:

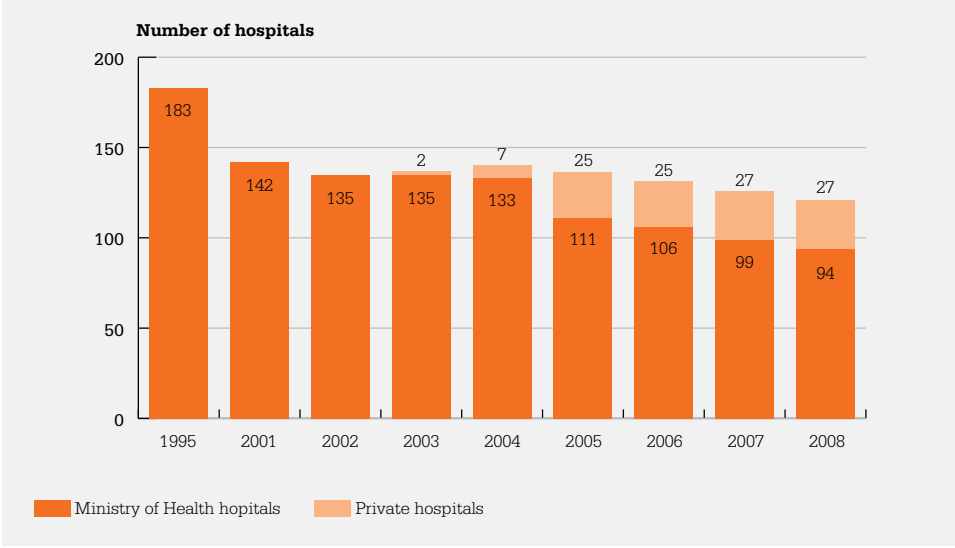
- the total number of hospital facilities
- actual hospital beds compared to target bed numbers (by marz)
- hospital beds per 10 000 population (nationally and by marz)
- hospital bed occupancy rate and average length of stay.

Total number of hospital facilities

The Armenian regional health system optimization programme *(26)* envisages reducing the number of inpatient care facilities in the marzes along with the number of hospital beds, through mergers and reorganization. Additionally, in each marz, one multisectoral hospital is to be designated for upgrading and improvement and to be staffed with qualified specialist physicians. The number of provincial (marz) inpatient care facilities decreased substantially between 2006 and 2008, while the number of hospitals in Yerevan has remained essentially unchanged (Fig. 24). The total number of hospitals (including private facilities) has decreased from 145 in 2005 to 130 in 2008. The decrease in public hospitals has been even more substantial – from 133 in 2004 to 94 in 2008, a decrease of more than 40% (Fig. 25).

Figs 24, 25. Number of hospitals, Yerevan versus the provinces and public versus private, 1995 and 2001–2008





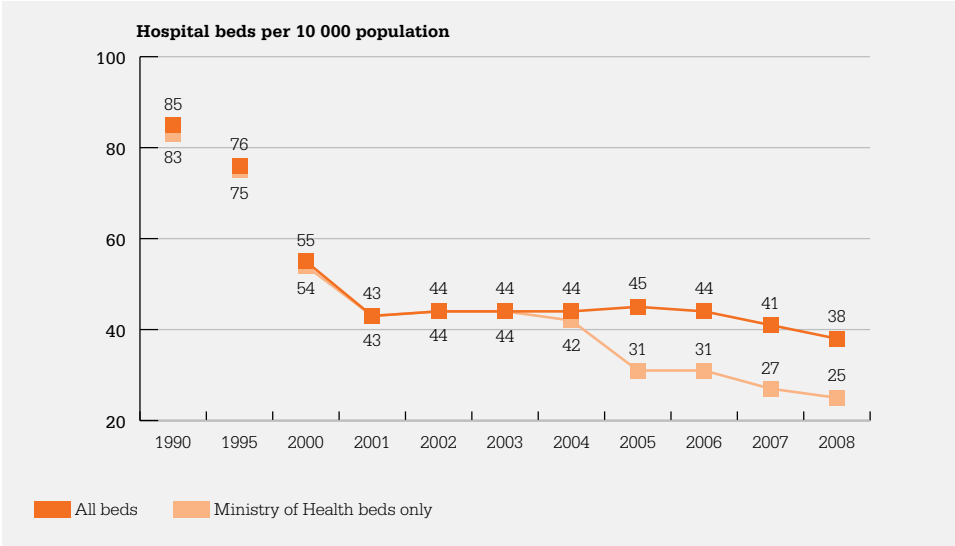
Source: NHIAC.

Beds per 10 000 population

Fig. 26 shows the overall decline in hospital beds per 10 000 population from 44.6 in 2005 to 38.2 in 2008. Again, the decrease in public hospital beds is especially significant, falling from 43.7/10 000 in 2003 to 24.8/10 000 in 2008. International comparisons (Fig. 27) show Armenia within the range of Georgia and the ER-27 average, and well below the rate for Azerbaijan.

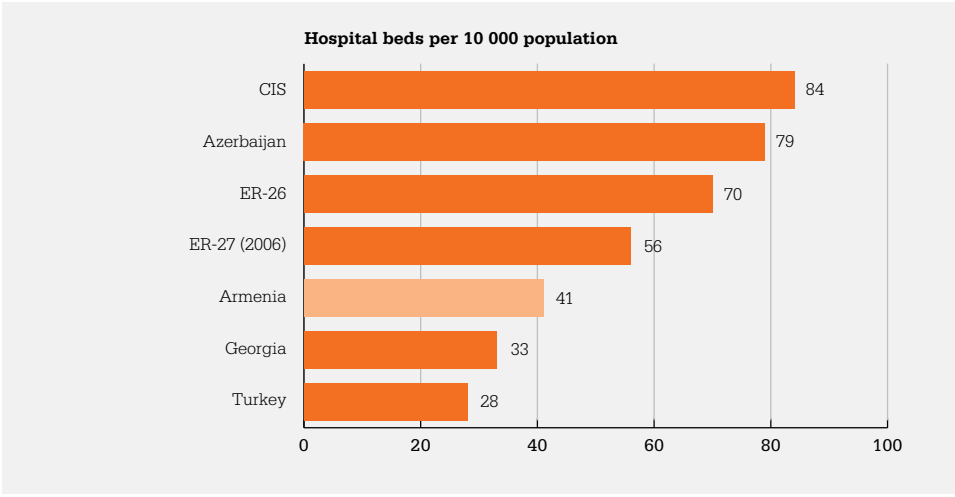
The reduction in beds has been spread across all marzes (See Annex B, Table B4). However, there are significant differences in the resulting bed concentrations among the marzes, with the lowest being 12.2/10 000 and the highest 33.5/10 000, a nearly threefold difference.

Fig. 26. Hospital beds per 10 000 population, 1990, 1995 and 2000–2008



Source: NHIAC.

Fig. 27. Hospital beds per 10 000 population, selected countries and country groups, 2007

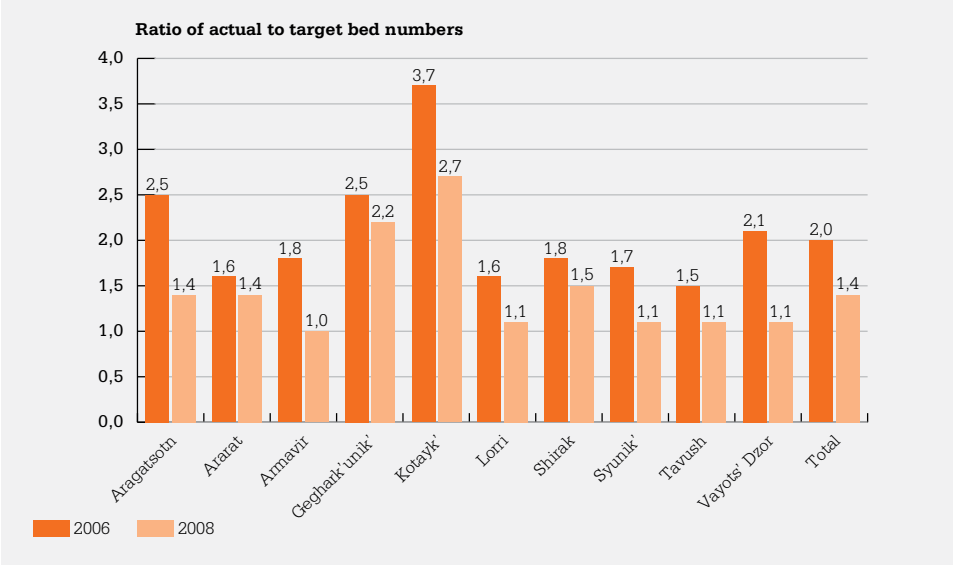


CIS: Commonwealth of Independent States; ER-26, ER-27: see description on p. 22.
Source: WHO Regional Office for Europe, 2009 *(9)*.

Number of hospital beds compared to optimization target by marz

The total number of hospital beds in 2008 is close to the target number for several marzes. Although there have been notable reductions in some marzes (particularly Kotayk'), there is still some way to go to achieve the targets in many. Fig. 28 shows the ratio of the actual number of beds compared to the target number of beds. A ratio of one indicates that the target has been met. The total number of beds in the marzes in 2008 was just over 5000, down significantly from nearly 6900 in 2006, but still about 40% more than the target of 3500 (see Table B4 in Annex B for more detailed data).

Fig. 28. Ratio of actual beds to target number of beds, by marz, 2006 and 2008

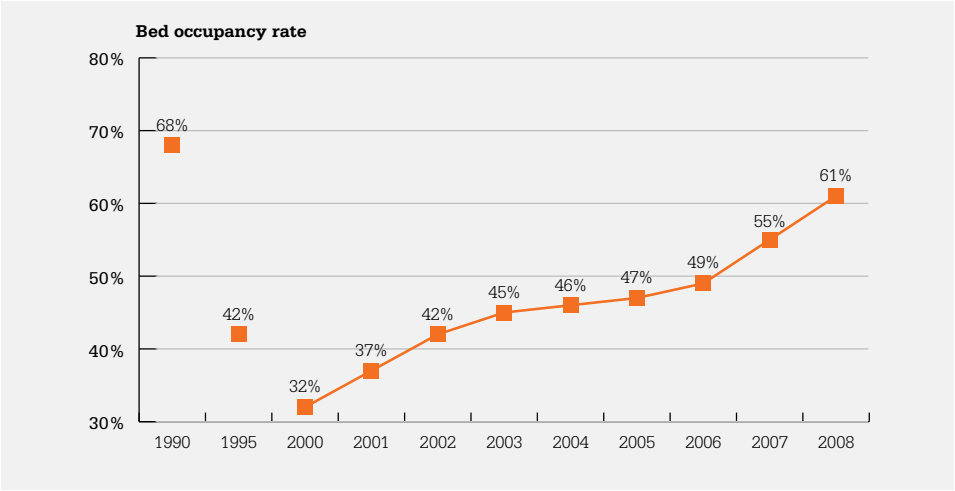


Source: NHIAC.

Utilization of hospital resources

As a result of the optimization programme and the reduction in the number of hospital facilities and beds, the cost–effectiveness of hospital sector performance in marzes (particular as measured by the bed occupancy rate) has increased significantly (Fig. 29).

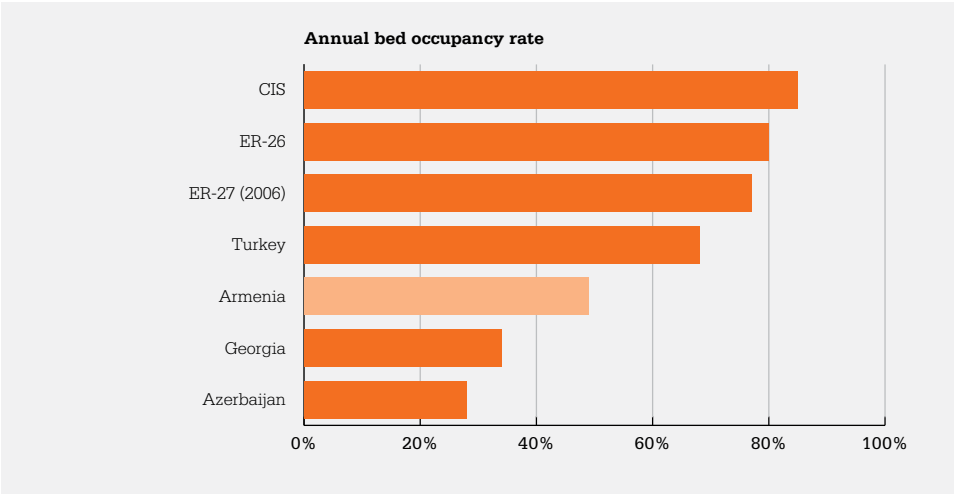
Fig. 29. Annual bed occupancy rate, all hospitals, 1990, 1995 and 2001–2008



Source: NHIAC.

Fig. 30 shows how Armenia's bed occupancy rate (albeit for acute care hospitals only) compares to that of other countries. The rate in 2007 was better than that for Georgia and Azerbaijan, but still well below Turkey's and the average for the ER-26 countries. Further progress towards optimization targets should continue to increase the occupancy rate and improve efficiency.

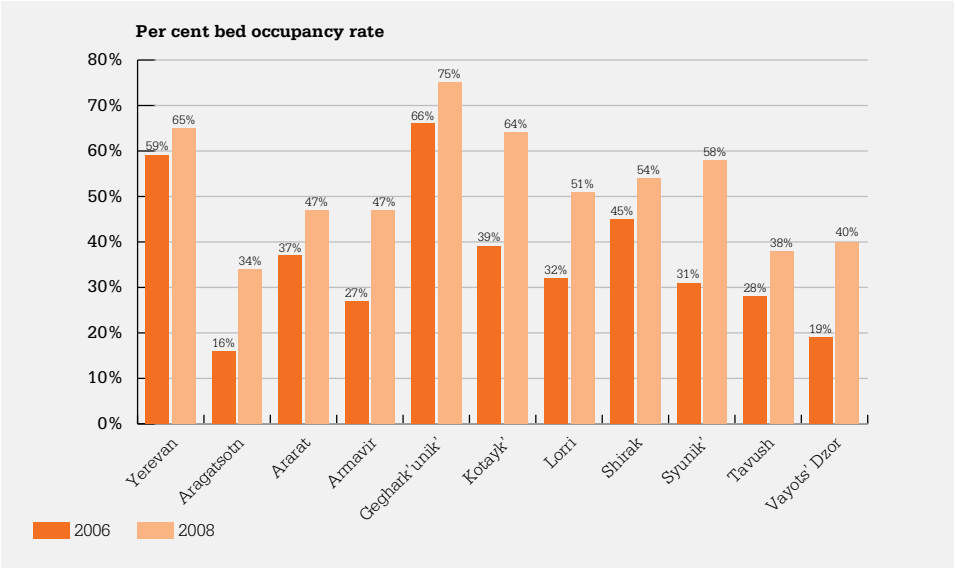
Fig. 30. Annual bed occupancy rate, acute care hospitals only, selected countries and country groups, 2007



CIS: Commonwealth of Independent States; ER-26, ER-27: see description on p. 22.
Note: While the other occupancy rates refer only to acute care hospitals, the rate for Armenia refers to all hospitals (e.g. mental health, chronic care), some of which will have longer average lengths of stay and higher bed occupancy rates than acute care hospitals.
Source: WHO Regional Office for Europe, 2009 *(9)*.

The bed occupancy rate has increased in all marzes and in Yerevan, and with a couple of exceptions, all occupancy rates are close to or over 50%. Occupancy rates in some marzes are well over 60%, including Yerevan (65%), which has a disproportionate share of Armenia's hospital volume.

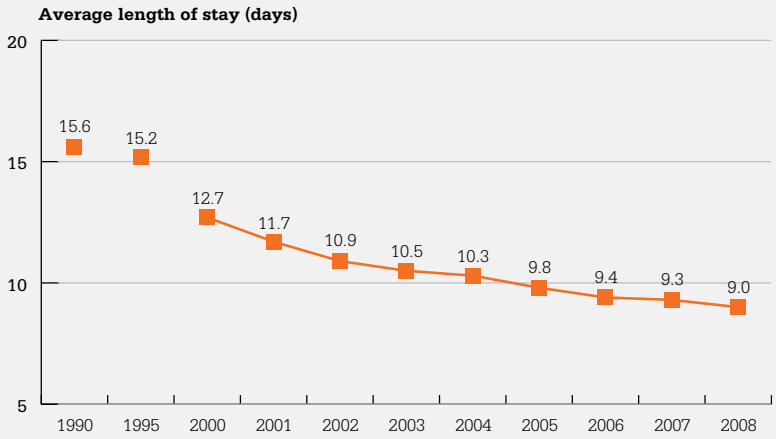
Fig. 31. Annual bed occupancy rate, by marz, 2006 and 2008



Source: NHIAC.

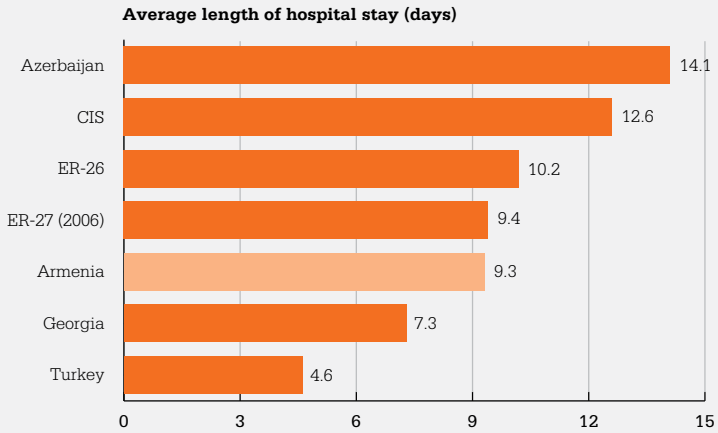
At the same time that hospital capacity has been reduced, the average length of hospital stays has also declined. Other things being equal, this development implies that more hospital admissions can be accommodated with the same or fewer hospital resources. Fig. 32 shows a steady decrease in the average length of hospital stay. As shown in Fig. 33, the average length of stay is lower than the average for the European Region but remains greater than in Georgia and Turkey.

Fig. 32. Average length of hospital stay in days, 1990, 1995 and 2000–2008



Source: NHIAC.

Fig. 33. Average length of hospital stay in days, selected countries and country groups, 2007



CIS: Commonwealth of Independent States; ER-26, ER-27: see description on p. 22.
Source: WHO Regional Office for Europe, 2009 *(9)*.

Although further progress in reducing the number of hospital beds should be reflected by improvement in other measures of hospital efficiency, complementary indicators must be monitored to ensure that this reduction in hospital capacity does not reduce access to hospitals or lead to reductions in length of stay that are not medically appropriate. The hospitalization rate must be tracked, particularly by marz. Also, it would be useful to track an indicator of hospital readmissions to monitor whether a decreasing length of stay might lead to an increase in the rate of readmissions.

Health information limitations and gaps

- There is a need for a more detailed breakout of the "other" and "salaries" categories of expenses in the structure of hospital and primary care expenditures (see Fig. 19). The current level of disaggregation may mask direct spending on patient care in the "other" category, and the "salary" category may also include salaries for administrative work and other work not directly involved in patient care.

- HSPA integrated survey data has been used to assess some aspects of primary care reform, particularly service utilization patterns. These survey questions need to continue to be asked in the HSPA survey or incorporated in other surveys. More frequent monitoring, as well as an expansion of monitoring to the subnational level, would be ideal during the reform implementation period.

- Outcome and quality indicators are needed to measure the effectiveness of primary health care. They could be based on clinical outcomes, such as control of high blood pressure or control of glucose levels among diabetics, and they might be supported by the reporting of primary care facilities. Such indicators could also track the perceived quality of primary care services or satisfaction with them. Finally, these indicators could be captured in the Service Availability Mapping (SAM) activity, which would provide information on service delivery "readiness", i.e. the availability of specific services, basic medicines, equipment, trained personnel and guidelines, etc.

Summary of findings and policy recommendations

Table 7. Findings and policy recommendations: health system efficiency

Situation	Policy recommendations
There are some indications that health spending is becoming more efficient. The proportion of expenditures going to salaries and drugs and pharmaceuticals increased somewhat between 2006 and 2008 for hospitals and primary care facilities. As planned, the government has also significantly increased its allocation of expenditures to primary health care. However, as Hawkins & Ibraimova have noted *(5)*, the primary care sector may be unable to utilize such rapid increases in funding effectively.	Monitor and report health care expenditures at a more detailed level in order to monitor the share of health care expenditures devoted to direct patient care. For example, break out expenditures on salaries for patient care providers and salaries for administrative personnel. Establish policy instruments, such as payment methods, to influence the quality and range of primary care services. Clarify the delivery model to ensure the effectiveness of increased spending in the primary health care sector.
Coincident with increased government investment in primary care providers and facilities, the population appears to be making increased use of primary care services, with a higher proportion of them indicating that they usually visit a primary care facility first when they require care. At the same time, the percentage of visits to health centres, particularly in urban areas, has increased. In urban areas they are often private facilities requiring out-of-pocket payments, which may indicate that some people prefer private facilities to public polyclinics. Also, although results for previous years are not available, the current rate of self-referrals to hospital for non-emergency conditions (bypassing primary care) appears high.	Continue with investment, retraining and reform in the primary health care sector. However, ensure also that the long-term strategy for primary health care is clear. Consider using indicators of primary care responsiveness (for example, perceived quality of services or public satisfaction with them) and "readiness" to provide services (for example, the availability of specific services, basic medicines, equipment, trained personnel and guidelines). Such indicators may help explain the varying levels of utilization of primary care services.
Progress has been made on the hospital optimization strategy, with significant reductions in excess hospital capacity. Current capacity and bed occupancy still vary significantly among the marzes. At the same time, overall occupancy rates have increased and average length of stay has decreased, indicating increased efficiency. It should be noted, however, that some countries in the European Region have achieved even better results on these measures.	Continue to implement hospital optimization measures. Focus on marzes where capacity still remains significantly greater than planned. Monitor the hospitalization rate. Increasing occupancy rates due to capacity reductions may mask problems with access to hospital admissions. Monitor hospital quality indicators such as readmission rates to ensure that decreases in length of stay are medically appropriate.

6. ACCESS TO HEALTH CARE SERVICES

Providing all citizens access to appropriate health care services based on their needs is one of the key objectives of a health system. Any financial, geographical or informational barriers to access should be addressed with relevant strategies, such as reducing out-of-pocket health expenditures or increasing public awareness about entitlements to health care benefits.

In this chapter we also examine two subsidiary dimensions of access, with related policy questions.

1. Are health services accessible to everyone who needs them, especially the most vulnerable? To address this question we will review indicators related to utilization of medical services, along with an indicator of the financial barriers to access services.

2. Are pharmaceuticals becoming more accessible to those who need them through a combination of state investment in drug benefits and the capacity of the population to pay? To address this question we review the state and private share of pharmaceutical expenditures, as well as the availability of generic drugs.

Utilization of medical services

Utilization of health care services is not the same as access to services, but in a health system such as Armenia's, where the level of utilization of medical services has been comparatively low, it is reasonable to assume that increases in utilization rates reflect a decrease in barriers to access. Two indicators were reviewed to assess utilization and related access to services:

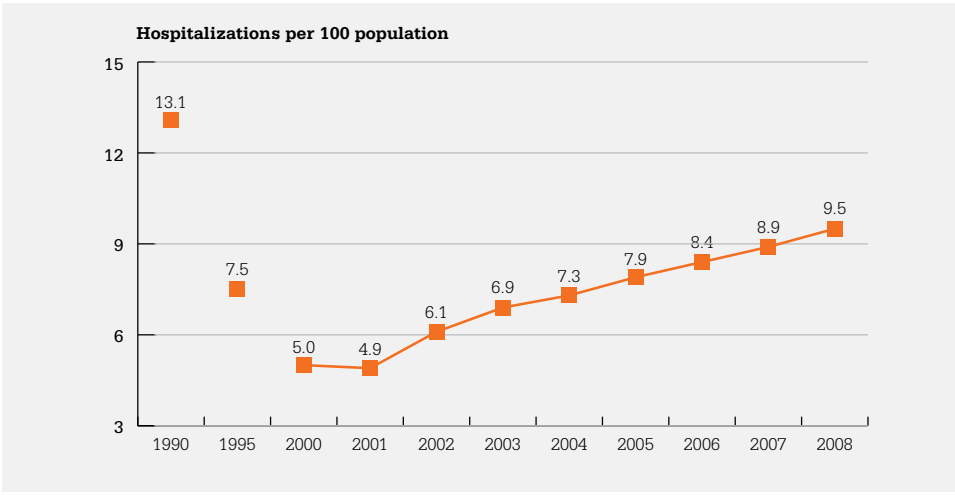
1. hospitalization rate per 100 population

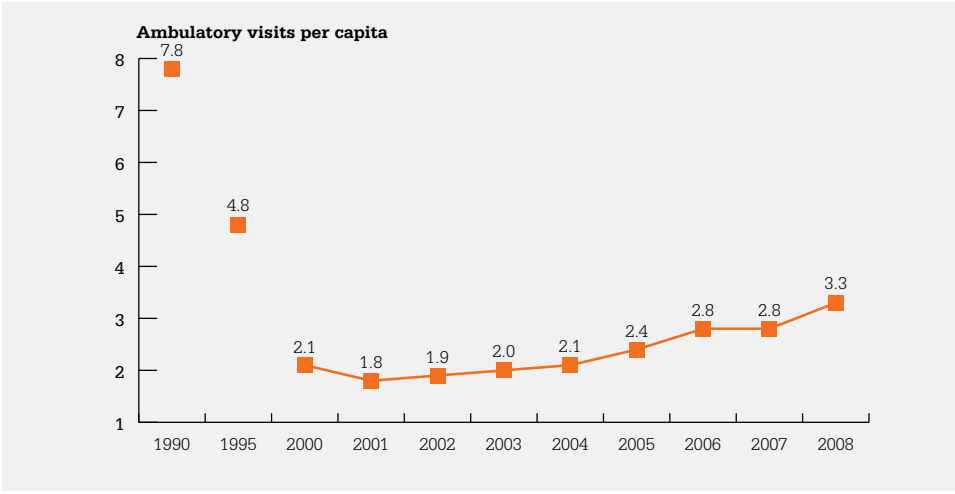
2. ambulatory care visits per capita.

The utilization of both medical services (hospitalizations and ambulatory visits) has increased since 2001 and may be explained in large part by recent economic growth in the country. On one hand, this growth has enabled an increase in government financing of the health system – in particular, the full set of primary care services has been available free of charge since 2006. On the other hand, economic growth has led to higher personal income levels, making medical care more affordable for the population. The trends in the utilization of medical services in 2006–2008 also followed this pattern.

The hospitalization rate per 100 population increased from 8.4 in 2006 to 9.5 in 2008, an increase of 13%, while the number of annual ambulatory visits increased from 2.8 to 3.8 visits per capita (Figs 34 and 35).

Figs 34, 35. Annual hospitalization rate per 100 population and ambulatory visits per capita per year, 1990, 1995 and 2000–2008



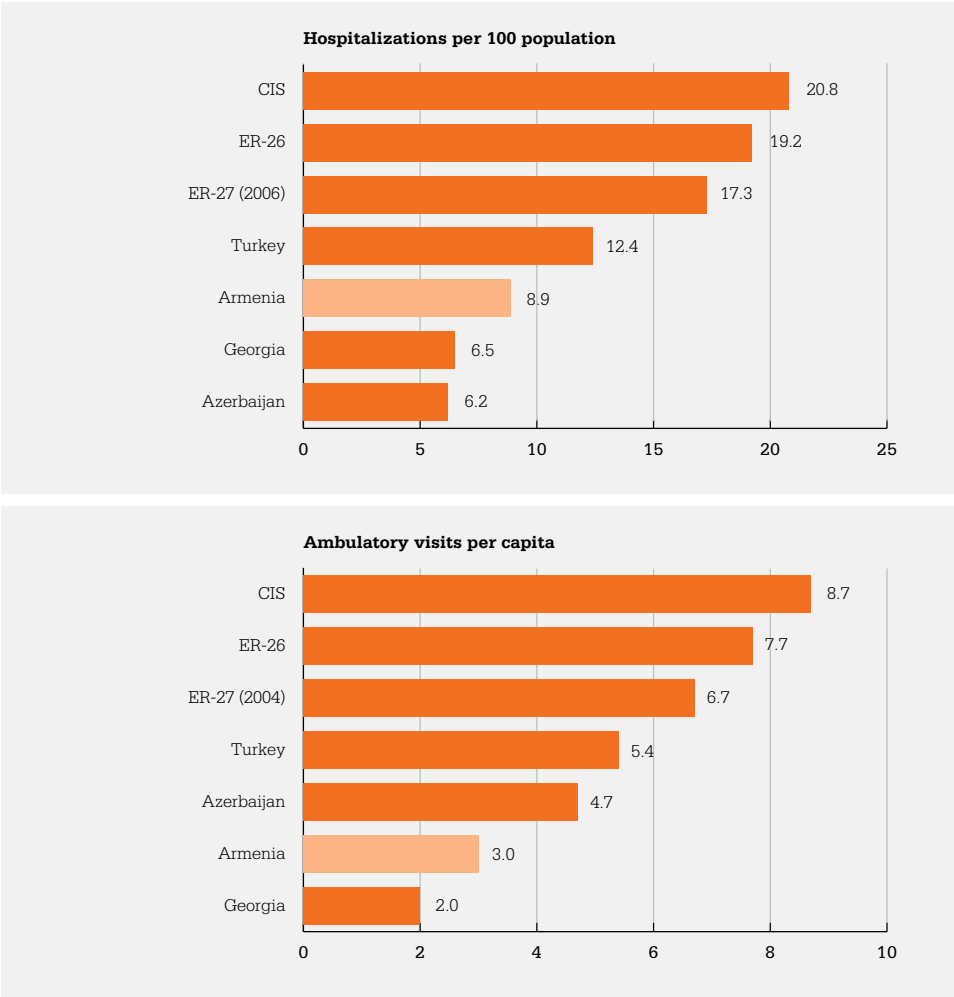


Source: NHIAC.

Despite the increase in ambulatory visits per capita over the past few years, the rate for Armenia remains low compared to other countries in the region (see Fig. 37), being lower than that for Turkey and Azerbaijan, but higher than that for Georgia.

The hospitalization rate for Armenia is slightly higher than the rates for Georgia and Azerbaijan (see Fig. 36) and below the average for European Region countries.

Figs 36, 37. Hospitalization rate per 100 population and ambulatory visits per capita, selected countries and country groups, 2007

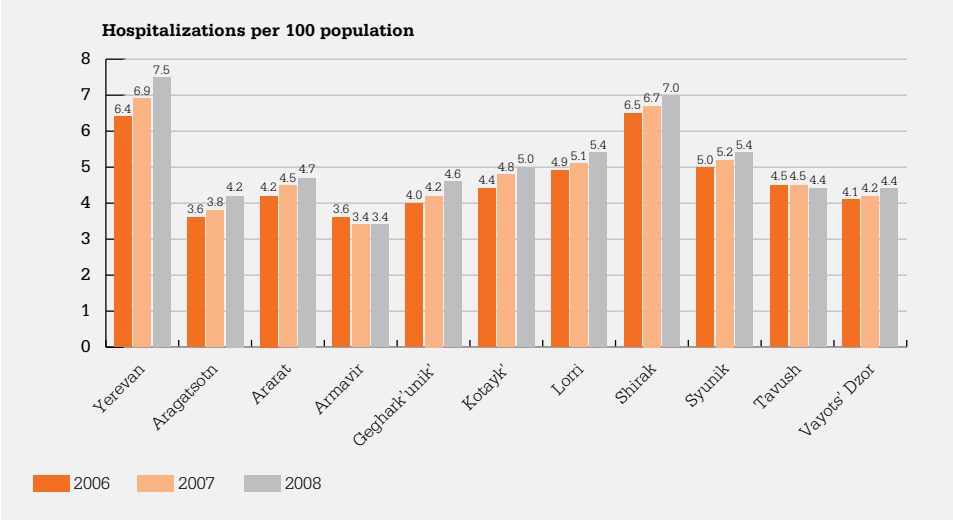


CIS: Commonwealth of Independent States; ER-26, ER-27: see description on p. 22.
Source: WHO Regional Office for Europe, 2009 *(9)*.

The increase between 2006 and 2008 in the hospitalization rate in Ministry of Health hospitals was observed in every marz with the exception of Armavir (decrease of 6%) and Tavush (decrease of 2%) (Fig. 38). The highest relative increases occurred in Yerevan (17%) and Aragatsotn (16%). This utilization measure has been calculated by dividing the total number of hospitalizations in a marz by the population of the marz, and it is possible that some of the increase in Yerevan is due to people from

other marzes travelling to Yerevan for care. However, that would need to be confirmed through an analysis of hospitalization rates for the population living in the marzes, regardless of where they received care.

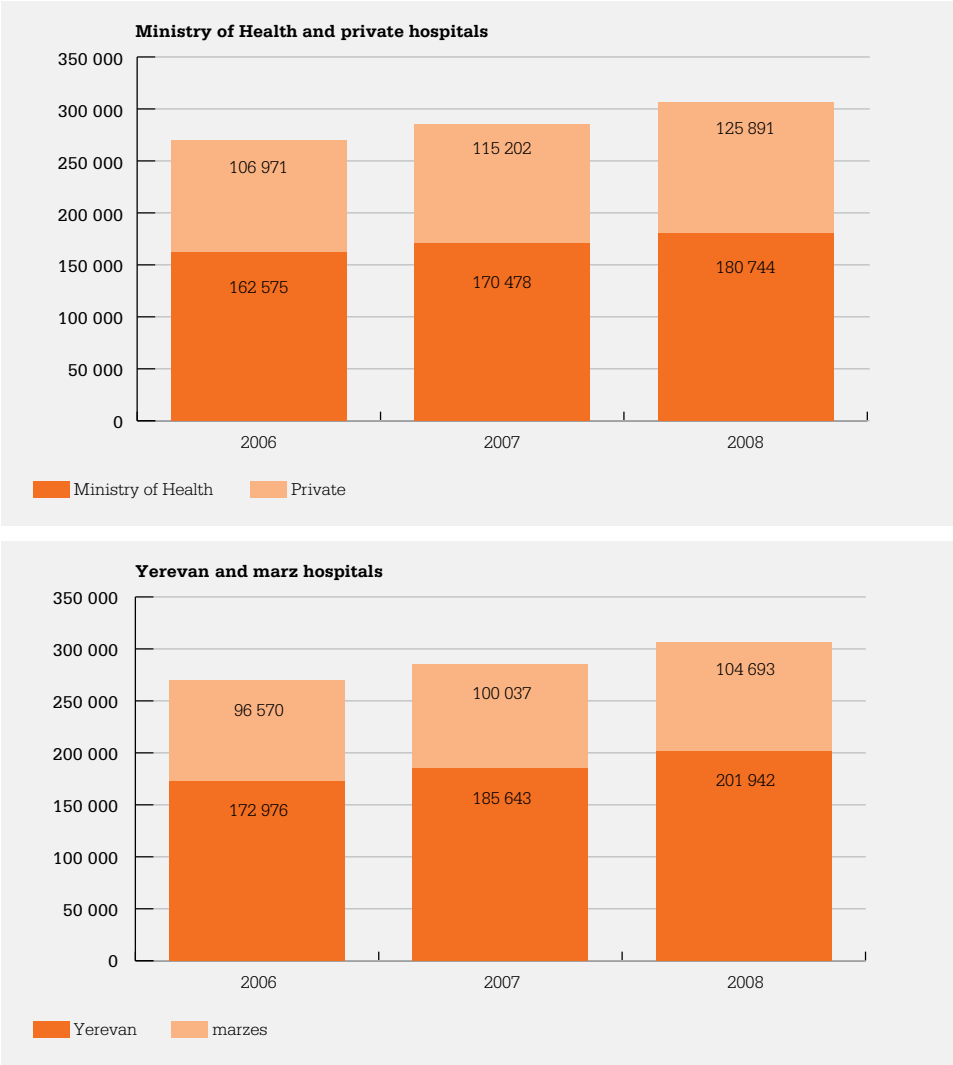
Fig. 38. Hospitalization rate for Ministry of Health hospitals per 100 population, by marz, 2006–2008



Note: The data for Yerevan include only the hospitals under the Municipal Health Department. The hospitalization rates for other Ministry of Health facilities were not included, as they serve the entire country, not just Yerevan. The summary data for changes in hospitalization rates in the marzes are presented in Annex B, Table B8.
Source: NHIAC.

Regarding patients admitted to hospitals in 2006–2008, the number of patients admitted to Yerevan hospitals has steadily grown, comprising a larger percentage of all admissions; that is the case with private hospital admissions as well (Fig. 39). Fig. 40 also shows that absolute numbers of hospital admissions have increased in the marzes. It should be mentioned however that while admissions in Yerevan increased by 16.7%, the increase in the marzes was only 8.4%.

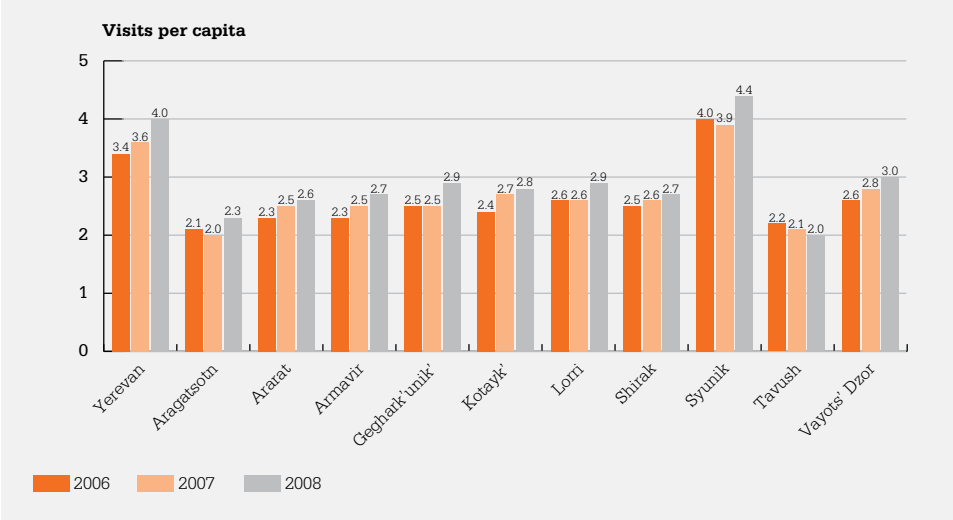
Figs 39, 40. Number of patient admissions, Ministry of Health versus private hospitals and Yerevan versus marz hospitals, 2006–2008



Source: NHIAC.

The number of ambulatory visits per capita increased between 2006 and 2008 in all marzes except Tavush, where it decreased by 9% (Fig. 41). The highest increases, of approximately 17% each, were registered in Armavir, Geghark'unik' and Kotayk' marzes.

Fig. 41. Annual ambulatory visits per capita, by marz, 2006–2008



Source: NHIAC.

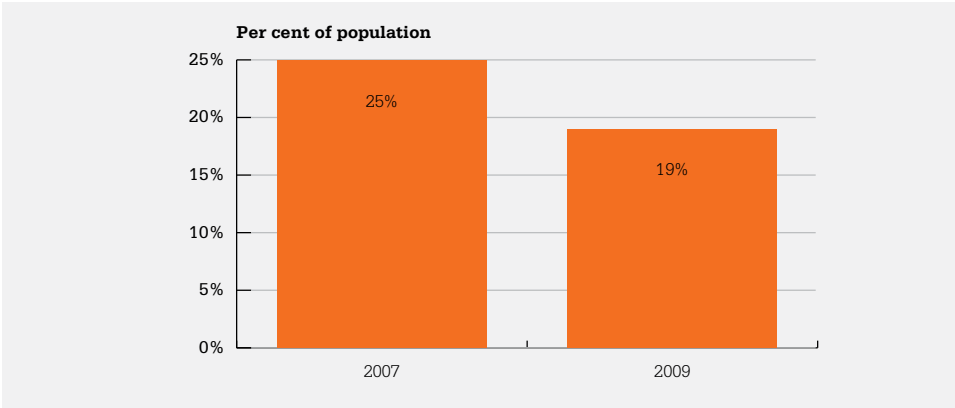
People who do not seek medical care when they need it

Although information about utilization can tell us whether there has been an increase in the use of health care services, it does not tell us directly if people used health care services when they believed they had a need for them. Questions from the 2007 and 2009 HSPA surveys attempt to determine the extent of barriers to access[7].

Between 2007 and 2009 the percentage of individuals not seeking medical care when there was a perceived need decreased from 24.6% to 19.0% (Fig. 42). The results for this indicator were similar for both urban (18.2%) and rural (20.8%) areas.

7 The following question was used during the HSPA 2007 and 2009: "Were there any cases within the last 12 months when you thought that there is a need to visit a doctor, ambulatory/polyclinics, hospital but have not done so?"

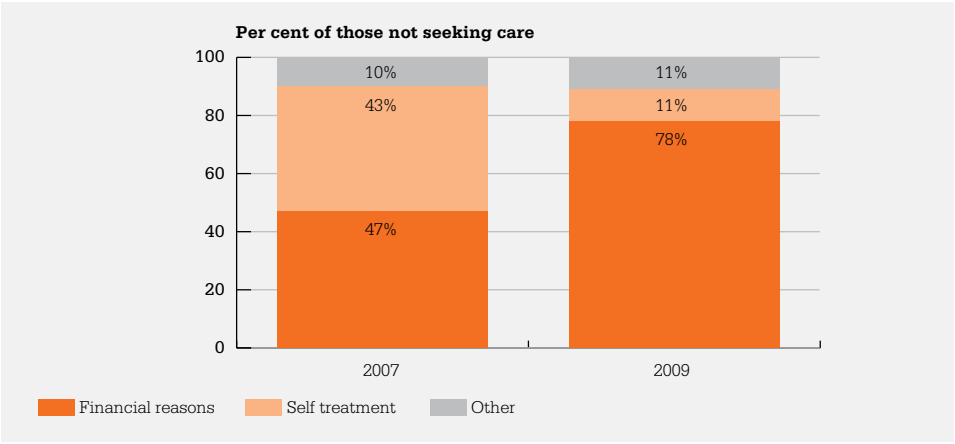
Fig. 42. Percentage of population age 20 and older that did not seek medical care when they needed it, 2007 and 2009



Sources: HSPA 2007 and 2009.

While the percentage of those not seeking medical care decreased overall, the reasons they gave for not seeking care changed significantly too, with a higher proportion of respondents indicating financial reasons (Fig. 43). That may be at least in part a reflection of the economic downturn in 2009 and its impact on household finances.

Fig. 43. Reasons for not seeking health care, 2007 and 2009

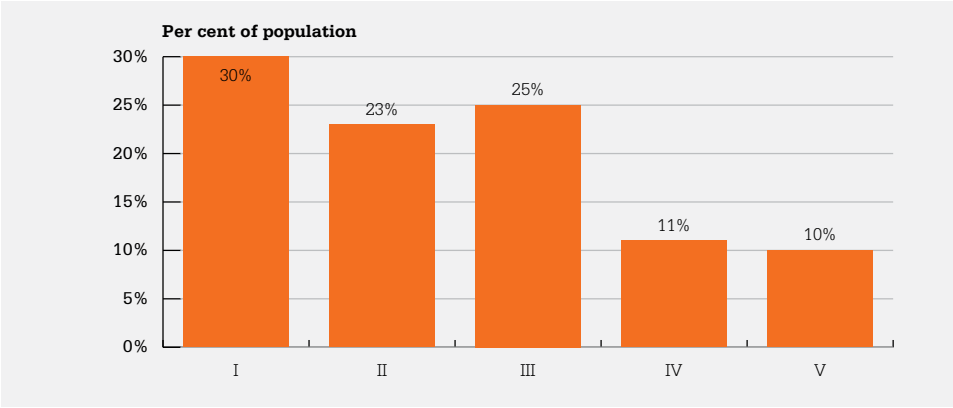


Sources: HSPA 2007 and 2009.

The results for 2009 also show significant differences by wealth quintile. The percentage of people who did not seek medical care when they perceived a need was 30.1%

in the lowest income quintile (I), a rate three times higher than that of the highest income quintile (9.9%, V) (Fig. 44). Nearly 86% of the respondents in the lowest wealth quintile identified financial reasons as the most important reason for not seeking care, compared to 60.3% in the highest wealth quintile.

Fig. 44. Per cent of population not seeking medical care when needed, by wealth quintile, 2009

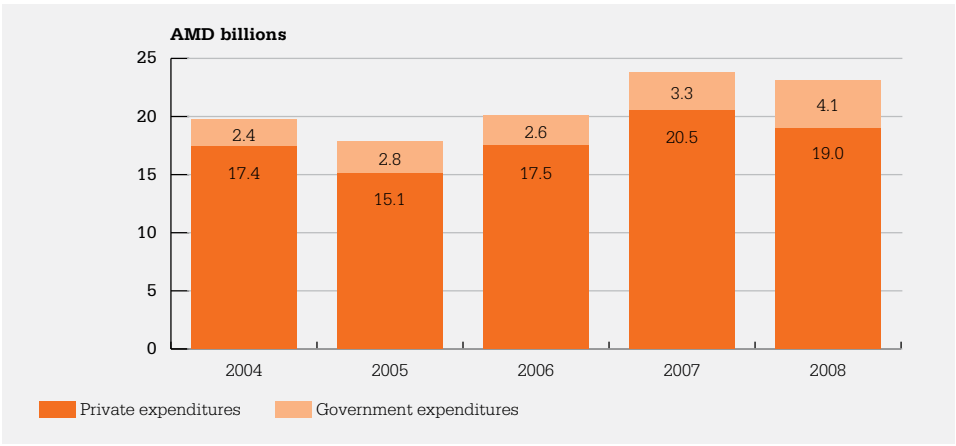


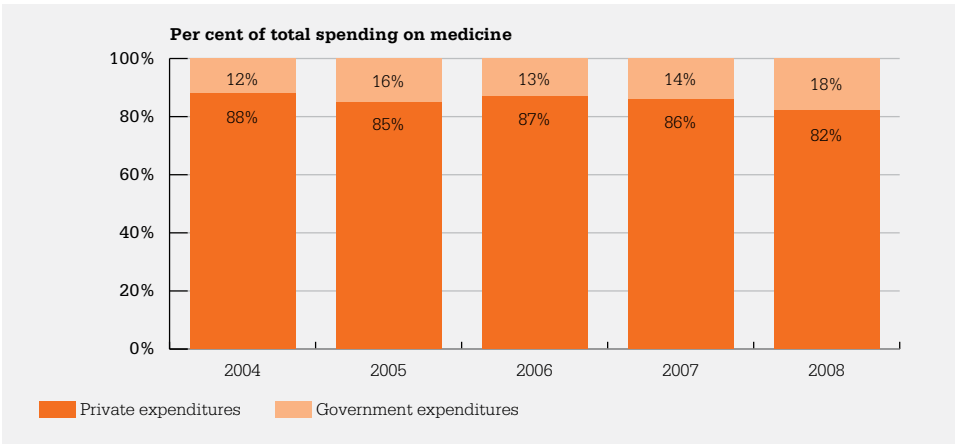
Source: HSPA 2009.

Access to medicines

Pharmaceuticals have become an increasingly important component of treatment for many diseases and conditions. The population must have access, not only to the services provided by medical personnel, but also to the treatment components, including medicine. Information from the National Health Accounts (NHA) indicates that households bear the main burden of expenditures on medicine in Armenia. In 2008, spending by households on medicine amounted to AMD 19 billion, or 82.2% of the total expenditure on medicines, both public and private, while government spending was AMD 4.1 billion or 17.8% of the total (Figs 45 and 46). Moreover, household spending on medicines picked up rapidly between 2005 and 2007. Although household spending declined again in 2008, the drop may partly be explained by the economic downturn, which lowered households' discretionary income.

Figs 45, 46. Private and government expenditures on medicines, in billions of drams and as percentages of the total, 2004–2008

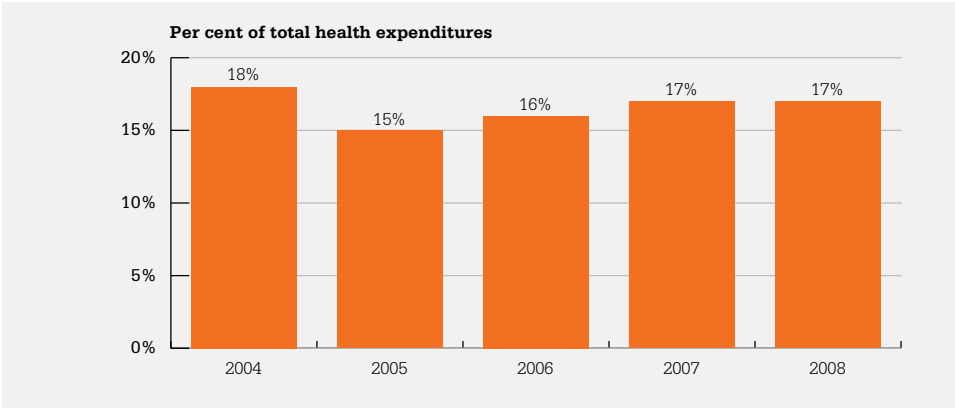




Source: NHA.

Overall expenditure on medicines as a percentage of total health expenditures has remained consistent between 2004 and 2008 (Fig. 47).

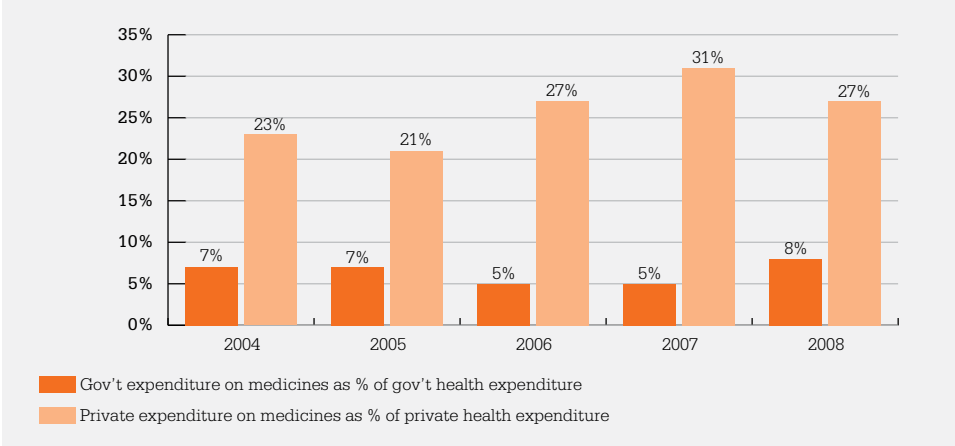
Fig. 47. Overall expenditures on medicines as a percentage of total health expenditures, 2004–2008



Source: NHA.

Government expenditure on medicine as a percentage of total government health expenditure has remained relatively constant in the period 2004–2008, starting at 7.3% in 2004 and finishing at 7.6% in 2008 (Fig. 48). Medicine expenditures as a percentage of total private expenditures on health, however, increased from 23.3% in 2004 to 27.2% in 2008 (with a high of 30.6% in 2007).

Fig. 48. Government and private expenditure on medicines as a per cent of total health expenditure, Armenia, 2004–2008



Source: NHA.

In developing countries, especially those characterized by greater inequity in income or asset distribution, the availability of generic drugs (which are less expensive than brand-name drugs) can be a proxy indicator for drug accessibility. In Armenia, the percentage of them for which generic versions are available is high: 95.2% in 2005 and 98.3% in 2008 (J Quisling, Experimental Centre of Drugs and Medical Technologies, personal communication, 29 July 2009).

It should also be noted that there have been cases when medicines were not available for conditions that are specified as being covered by the basic benefit package (specifically, drugs for treating diabetes mellitus, ischaemic heart disease and high blood pressure). The Service Availability Mapping activity, which the chapter on the health information system recommends doing, can provide information on the availability of essential medicines in health facilities.

Health information limitations and gaps

- Hospital and ambulatory care utilization rates are reported by marz. However, it is also important to understand the extent to which people travel from their marz to Yerevan for hospital care, and the type of care they receive outside their marz (i.e. specialty or tertiary care). A simple addition to the standard reporting forms would answer this information need, i.e. by enumerating the patients who reside in the local catchment area (the marz) and those who reside outside it.

- This analysis along with other analyses of utilization and access to services could be accommodated with a complete database of all hospital cases – in the Ministry of Health system as well as in private hospitals – and treatment costs should be collected and recorded for all cases, not only for those included in the basic benefit package.

Summary of findings and policy recommendations

Table 8. Findings and policy recommendations: access to health care services

Situation	Policy recommendations
Utilization rates for both hospital inpatient services and ambulatory services have been steadily increasing since 2000. This increase has occurred in almost all marzes. While utilization gives us only a partial picture of access to services, this trend suggests that barriers to access have been decreasing. Nonetheless, a significant portion of the population (nearly one fifth) reports not seeking medical care when they felt it was needed. The percentage of people in this group was highest in the lowest wealth quintiles (20–30% in the three lowest quintiles versus 10% in the two highest). Of those who have reported not seeking medical care, nearly 80% cite financial reasons.	In developing and implementing policies on co-payments for health services, address the issue of financial barriers to access, focusing in particular on individuals in the lower income quintiles. In the end, it is likely that the only way to mitigate financial barriers for the poorer population will be appropriate increases in the government budget for health services. Keeping in mind that access cannot be monitored by only monitoring utilization, surveys should measure the percentage of individuals who are able to access care when they feel they need it.
The burden of payment for drugs is shouldered primarily by households. Although the proportion has fallen somewhat, private expenditures still finance over 80% of drug purchases. Access to drugs can also be restricted due to other factors, such as an inadequate supply of drugs covered by the basic benefit package or the exclusion of certain drugs from this package.	Regularly review and update the list of medicines covered by the basic benefit package to ensure that it reflects current treatment standards. Expand the list of medicines covered by this package if it is financially sustainable. Monitor the availability of essential medicines in all public and private health facilities, along with any change in prices, through a Service Availability Mapping.

7. QUALITY AND SAFETY OF HEALTH CARE SERVICES

The health system must provide health care services that are both safe (avoiding harming patients) and of high quality (effective in achieving intended outcomes). Key challenges for improving the quality of health care services include:

- to redesign health care procedures based on best practice;
- to use evidence-based medicine to improve clinical practice;
- to improve the use of information technology to improve access to clinical information and support clinical decision-making;
- to coordinate care involving different patient conditions, services or settings over time; and
- to incorporate performance and outcome measurements for improvement and accountability.

This chapter looks at indicators that answer two policy questions.

1. Are the health care services that the health system provides to the people of Armenia safe and of acceptable quality, and do these services lead to acceptable health outcomes?

2. Are the health care services that the health system provides to women and children safe and of acceptable quality, and do they lead to acceptable health outcomes? How well do these services reflect the Strategy for Improvement of Maternal and Child Health Care (2003–2015) and the Millennium Development Goals (MDGs)?

Medical care quality and safety

Various health care outcomes can be monitored to provide information about the effectiveness of health care services. For Armenia, the indicators used to examine trends in outcomes and safety are:

1. detection rates and treatment effectiveness for malignant neoplasms;

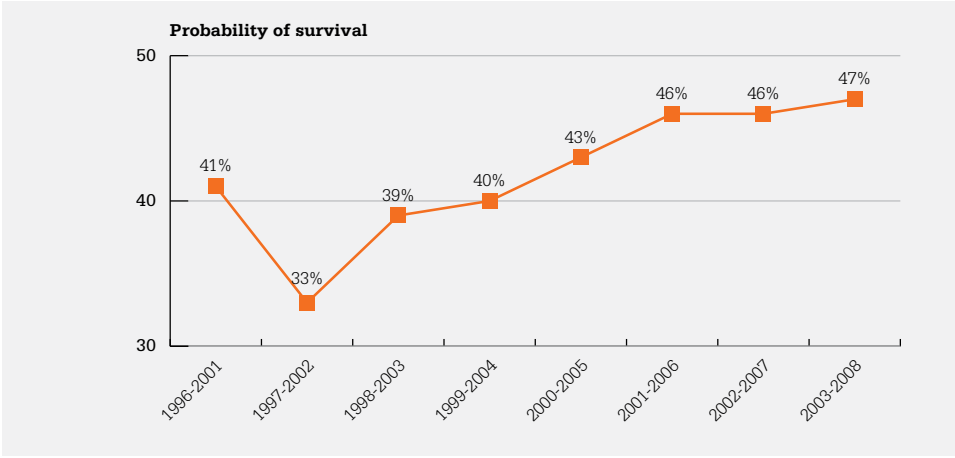
2. treatment success rates for tuberculosis (TB) and the prevalence of multidrug-resistant tuberculosis (MDR-TB); and

3. hospital fatality rates.

Detecting and treating malignant neoplasms

The National Oncology Centre (NOC) maintains statistics on malignant neoplasms, providing insight into early detection and relative survival rates. Fig. 49 shows the trends in five-year survival rates for a diagnosis of breast cancer. The five-year survival rate for breast cancer has climbed steadily since 2002, reaching 47% in 2008 (for cancers diagnosed in 2003).

Fig. 49. Five-year survival rate following diagnosis of breast cancer, females 2001–2008

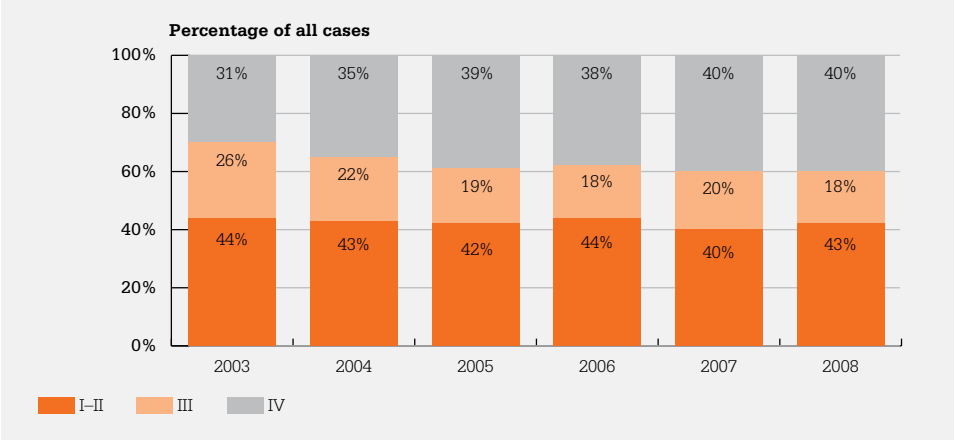


Source: National Oncology Centre.

A change in survival rates for cancer can result from a shift in the stage at which the disease is detected as well as from changes in the quality of treatment. While it is difficult to attribute differences in survival rates specifically to one of these factors, the detection rates for various stages of these cancers have shown little change over the past six years.

Fig. 50 shows the results for detection of malignant neoplasms by stage of the disease. The percentage of neoplasms detected at early stages (I and II), when treatment can be more effective, is essentially unchanged since 2003. The percentage of cases not detected until Stage IV increased from 30.6% in 2003 to 39.9% in 2008, with the increase coming essentially from cases that would once have been detected in Stage III (Fig. 50).

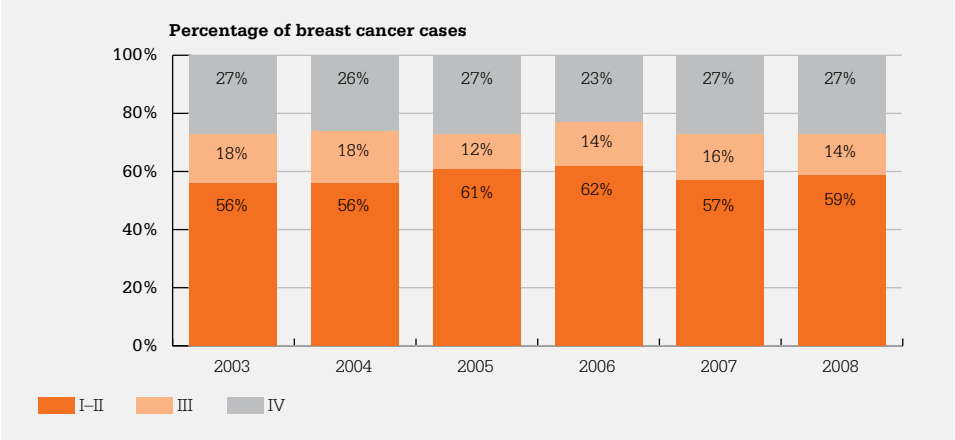
Fig. 50. Per cent of malignant neoplasms detected by stage of disease, all cancer, 2003–2008



Source: National Oncology Centre.

As shown in Fig. 51, the stage I and II detection rates for breast cancer have essentially stayed the same since 2003, and they are greater than for all cancers generally.

Fig. 51. Per cent of malignant neoplasms detected by stage of disease, breast cancer, 2003–2008

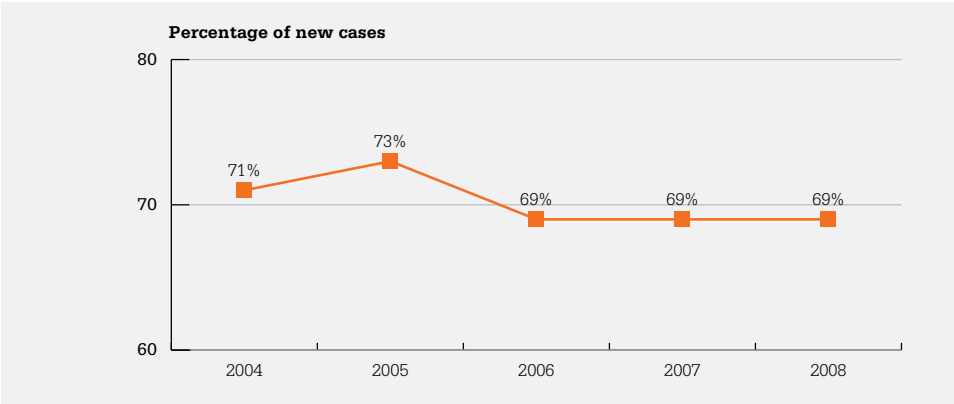


Source: National Oncology Centre.

Effective treatment of TB

The DOTS (directly observed treatment, short-course) programme was introduced in Armenia in 1995 with relevant evaluation and monitoring indicators, including indicators to assess the quality of TB treatment. These indicators include the treatment success rate (Fig. 52) and the number of drug-resistant TB cases (Fig. 53) and The percentage of successfully treated TB cases changed very little between 2004 and 2008 and remains around the 70% level.

Fig. 52. Percentage of new TB cases that have been cured, 2004–2008



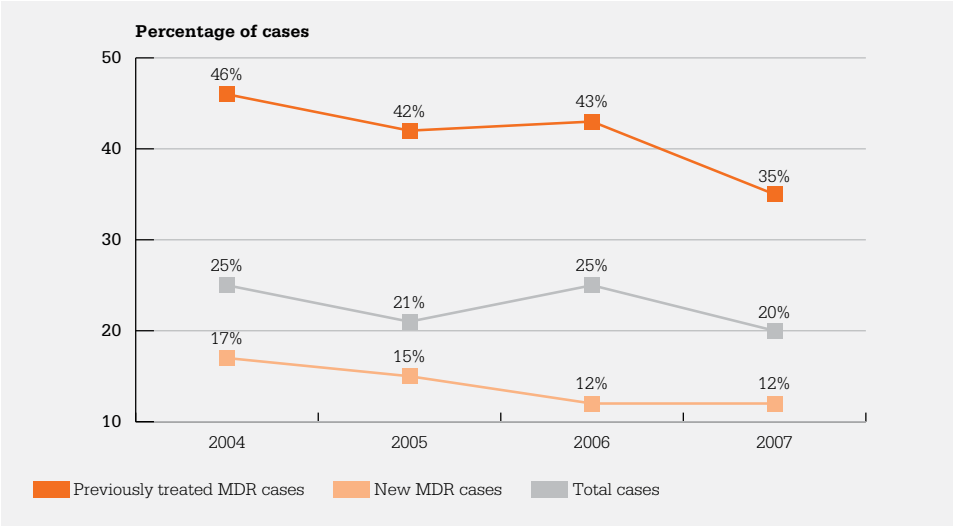
Source: Central Office of the National Tuberculosis Control Programme.

The National Tuberculosis Control Programme 2007–2015 includes plans to start the treatment of patients with multidrug resistant tuberculosis (MDR-TB) in 2008. Its goals include:

- achieving an 85% success rate for treatment of drug-receptive cases in 2009;
- reaching a 60% treatment rate for MDR-TB in 2015; and,
- ensuring at least a 20% reduction in the number of patients with drug-resistant TB among all new smear-positive cases.

The percentage of multidrug-resistant cases decreased between 2004 and 2007 (Fig. 53). That includes a significant reduction in the number of MDR-TB cases among previously treated MDR-TB cases in 2007. However, as described in a WHO report on drug-resistant TB *(27)*, Armenia is one of the countries with the highest prevalence of MDR-TB cases in the world (for the 2002–2007 period).

Fig. 53. Percentage of MDR-TB cases among previously treated cases, total cases and new cases, 2004–2007



MDR: multidrug-resistant.
Note: The number of tests performed at the National Reference Laboratory was 632 in 2004, 758 in 2005, 870 in 2006 and 642 in 2007.
Source: Central Office of the National Tuberculosis Control Programme.

Hospital fatality

Though the rate of in-hospital fatality can depend on a number of factors, including the age and overall condition of patients, safe, effective hospital care can help reduce this rate. Clinical studies show that timely, appropriate treatment is particularly effective in reducing mortality from cerebrovascular diseases and acute myocardial infarctions *(28)*.

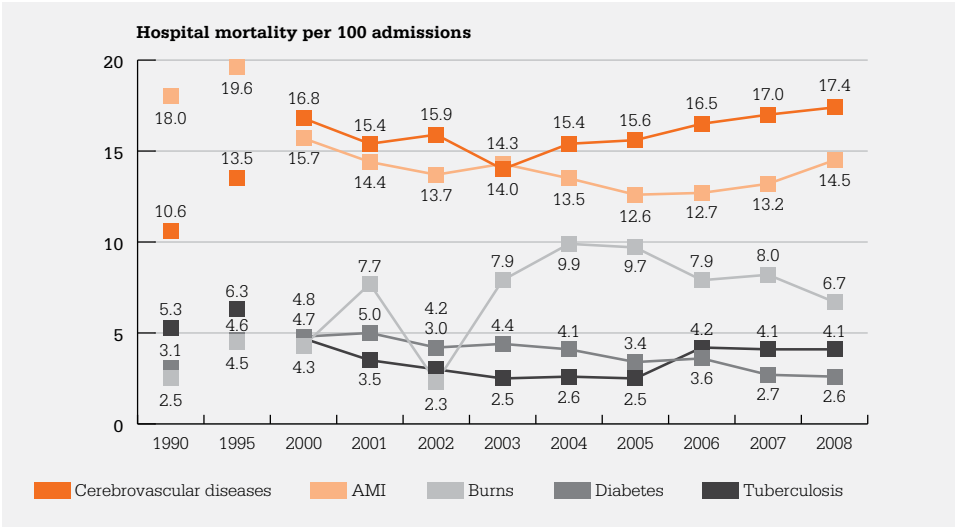
Between 2000 and 2008, the overall hospital fatality rate per 100 admissions decreased from 1.9 in 2000 to 1.5 in 2008 (Fig. 54). However, the mortality rates for cerebrovascular diseases and acute myocardial infarctions have again increased over the past three years after dropping somewhat between 2000 and 2004.

The fatality rate related to diabetes mellitus has declined steadily since 2004, as has the rate for burns (after first increasing after 2000) (Fig. 55). The fatality rate from TB, after dropping from 4.7 in 2000 to 2.5 in 2005, increased again to 4.1 in 2008.

Fig. 54. Hospital fatality per 100 admissions, all cases, 1990, 1995 and 2000–2008

Source: NHIAC.

Fig. 55. Hospital fatality per 100 admissions, selected conditions, 1990, 1995 and 2000–2008



AMI: acute myocardial infarction, CVD: cerebrovascular disease.
Source: NHIAC.

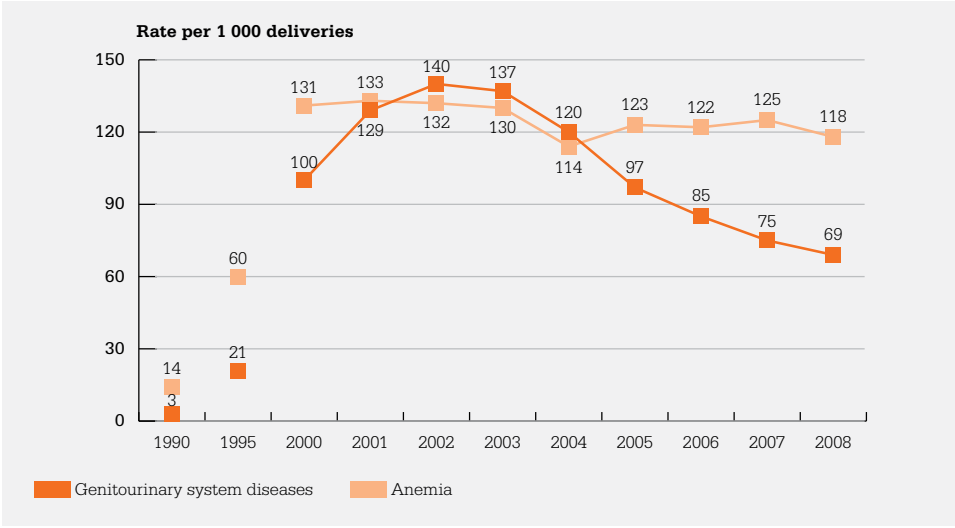
Quality of health services for women and children

Two groups of indicators are monitored to assess health care outcomes and the quality of health care services for women and children. The first group comprises health outcome indicators related to rates of natal and postnatal complications, including rates of caesarean sections. The second group comprises health care process indicators relating to cancer screening, maternal care, breastfeeding and immunization.

Natal and postnatal complications

The prevalence of natal and postnatal complications has generally decreased in Armenia since 2000, with the rate of genitourinary system diseases per 1000 deliveries declining from a peak of 140.1 in 2002 to 69.2 in 2008 (Fig. 56).

Fig. 56. Rates of selected natal and postnatal complications per 1000 deliveries, 1990, 1995 and 2000–2008



Source: NHIAC.

The Strategy for Improvement of Maternal and Child Health Care for 2003–2015 set a target of reducing complications from anaemia by 50% by 2015, but the target is not expressed explicitly and no baseline is designated.[8] However, current results are still

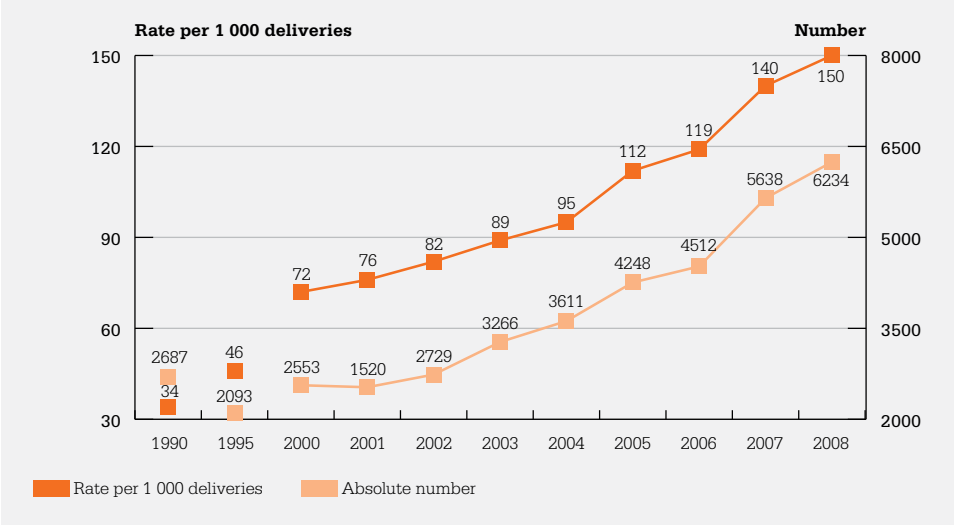
8 Since the strategy was approved in August 2003, we have assumed that the 2002 rate was the intended baseline. Such vague target setting is also found in other Armenian strategies.

far above what would be expected with a 50% reduction in the rate, and it is unlikely that the target will be met by 2015.

According to WHO, a rate of caesarean sections that is less than 50 per 1000 live births may indicate problems with adequate access to medically necessary services. However, inappropriate caesarean sections, those that are not medically indicated for the health of either the mother or the foetus, are costly to the health system and may put mother and child at risk for complications related to the surgery.

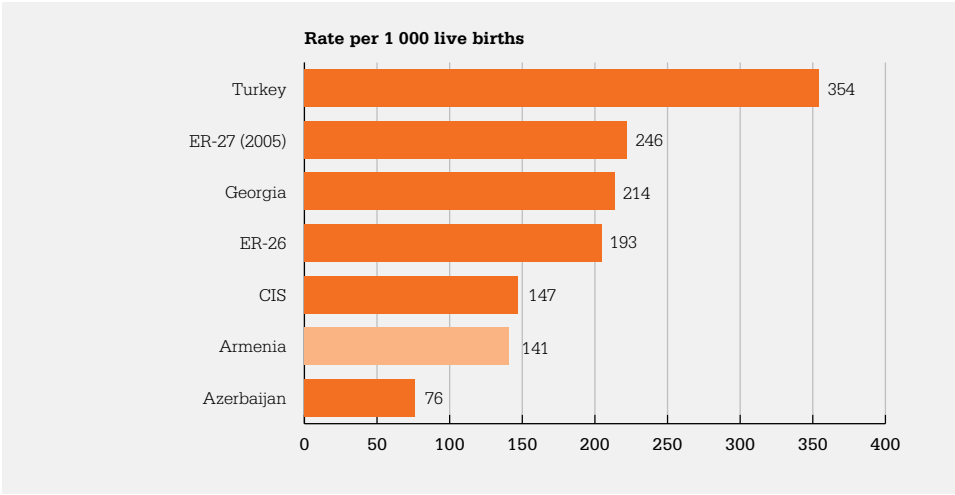
The rate of caesarean sections in Armenia has steadily grown, and in 2008 it was 150 per 1000 live births, well above a rate that might indicate problems with access (Fig. 57). On the other hand, the rate is also well below the rates of 200–300 per 1000 live births that are common in many developed countries (Fig. 58). Further analysis of results for this indicator would be useful to assess the medical appropriateness of the increasing rate of caesarean sections.

Fig. 57. Caesarean sections, rate per 1000 deliveries and number, 1990, 1995 and 2000–2008



Source: NHIAC.

Fig. 58. Rate of caesarean sections per 1000 live births, selected countries and country groups, 2007



Source: WHO Regional Office for Europe, 2009 *(9)*.

Maternal and child health care

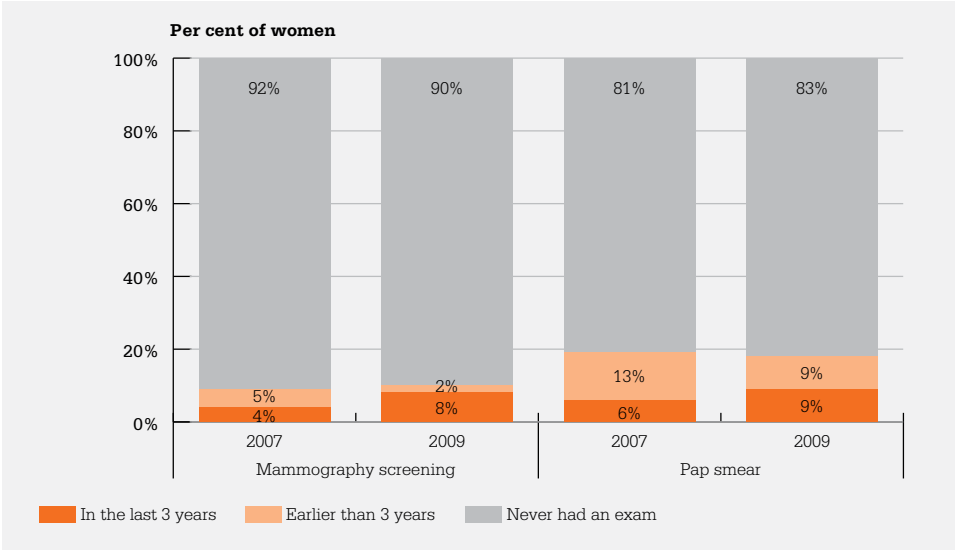
The core indicators for the quality and safety of maternal and child health care services address cancer screening services for women, early coverage of prenatal care, the breastfeeding rate and levels of child immunization.

Cancer screening. Preventive screening measures include breast examination by a physician, breast self-examination and mammography screening, all of which can lead to earlier detection of breast cancer, as well as Pap smears to screen for cervical cancer. Questions about mammography and Pap smear screening were included in the 2009 HSPA survey.

The 2009 HSPA indicates that 7.6% of Armenian women age 30–60 have had mammography screening during the past three years (the screening interval recommended by WHO), while another 2.3% have had at least one mammography screening, but not in the past three years (Fig. 59). Although the total percentage screened shows a small increase over results from the previous survey, the current rate is well below levels required to support improvements in the early detection of breast cancer and better treatment outcomes.

The WHO recommendation for Pap smears is the same as for mammography screening: women age 30–60 should have at least one Pap smear every three years. The 2009 HSPA indicates that there has been some improvement in the percentage of women who report having had a Pap smear in the previous three years, increasing from 5.6% in 2007 to 8.5% in 2009. However, the percentage of those who have never had a Pap smear remains more than 80%. Again, the screening rates are well below the levels required to support early detection and improve cancer treatment outcomes.

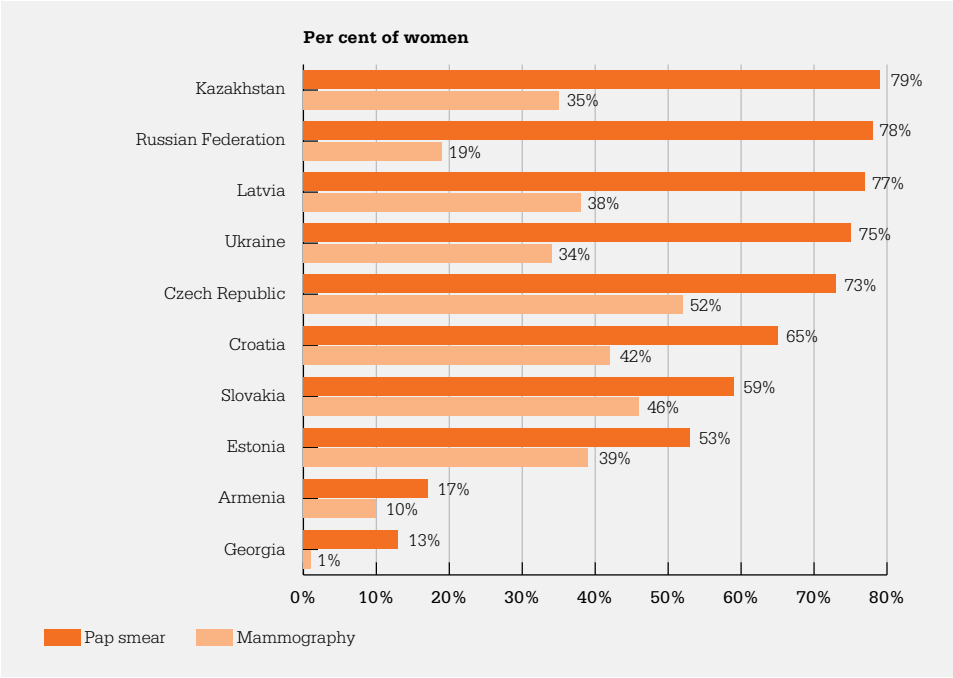
Fig. 59. Percentage of women age 30–60 who reported having had mammography and Pap smears, 2007 and 2009



Sources: HSPA 2007, 2009.

Selected international comparisons available for the period 2000–2006 *(29)* show that the coverage results for Armenia are well below those for other central and eastern European countries (Fig. 60).

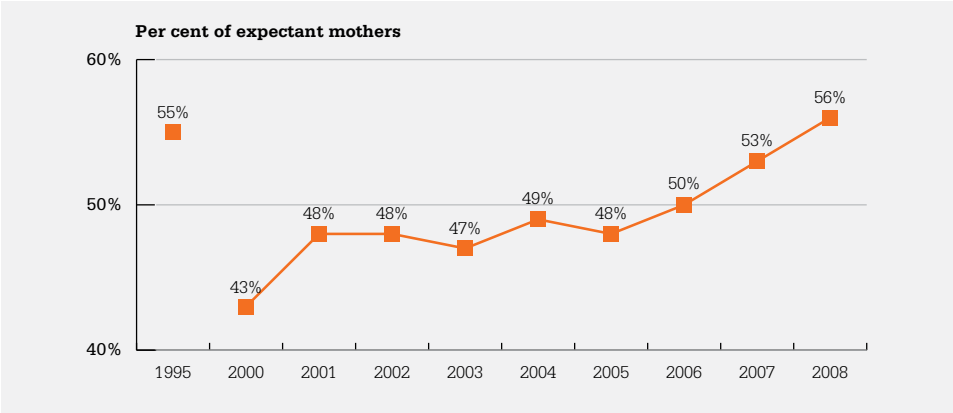
Fig. 60. Percentage of women who have had Pap smears and mammography, selected countries, 2000–2006



Source: WHO, 2008 *(30)*.

Early coverage of prenatal care. The Strategy for Improvement of Maternal and Child Health Care for 2003–2015 envisages "a twofold improvement of prenatal care indicators (by 2009)". The rate of early coverage of prenatal care was 44.6% in 2002, which would mean a target of close to 90% for 2009. Yet while there has been some increase since 2002, the 2008 rate of 55.7% is still well below this target. (Fig. 61).

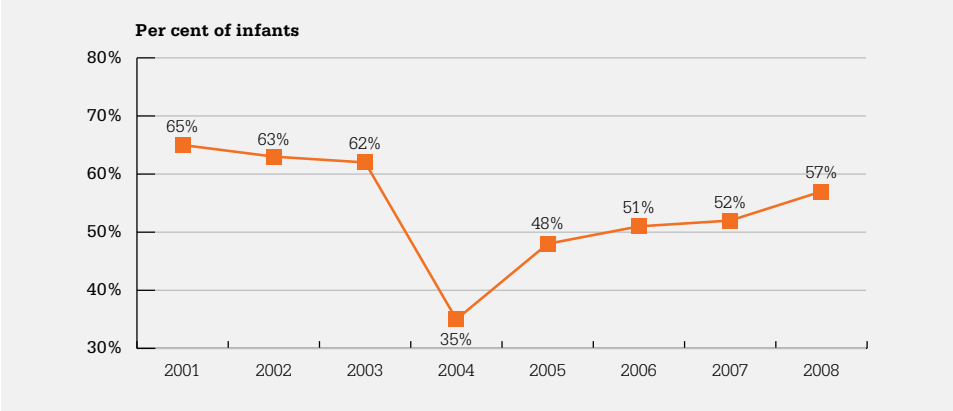
Fig. 61. Per cent of expectant mothers receiving early prenatal care (prior to 12 weeks), 1995 and 2000–2008



Source: NHIAC.

Breastfeeding coverage. The Strategy for Improvement of Maternal and Child Health Care for 2003–2015 plans "to ensure by 2009 that 65% of infants under 4 months and 40% of infants under 6 months are exclusively breastfed. The year when the Strategy was adopted (2003), the percentage of infants under 4 months who were exclusively breastfed was 62.3%, very close to target. However, the rate dropped significantly in 2004 to 34.5% (Fig. 62). Although it has increased since then to 57% in 2008, it remains below the target level.

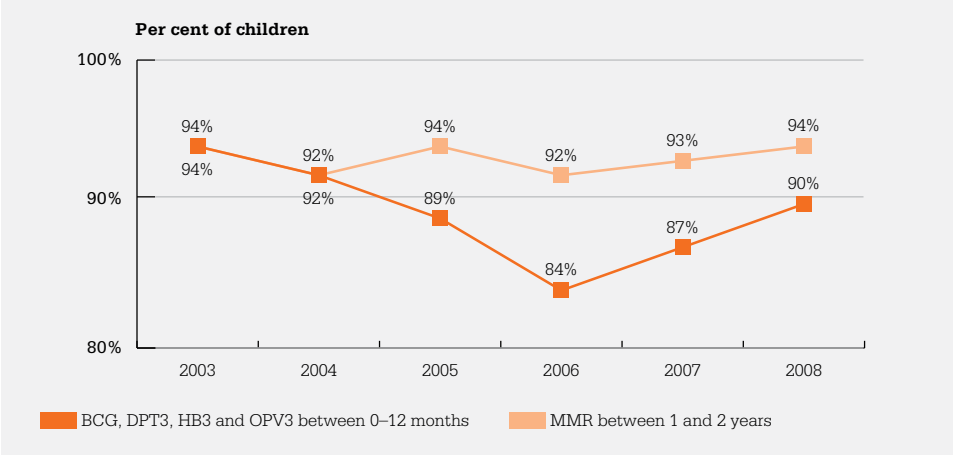
Fig. 62. Per cent of Armenian infants 0–6 months old who are breastfed, 2001–2008



Source: NHIAC.

Immunization. According to the MDGs for Armenia, the immunization rate of children under two years old should exceed 96%, for each recommended vaccine, by 2015. Similarly, the Strategy for Improvement of Maternal and Child Health Care for 2003–2015 sets a target of at least 95.0%. The results over the period 2003–2008 have been close to the target value for all vaccines (Fig. 63). In 1990, the reported full immunization coverage rate was already 95.2%. It should be noted, however, that official immunization coverage estimates do not compare well with survey estimates. For example, the official estimates of the percentage of children age 12–23 months who are immunized against measles (at least one dose) between 2003 and 2008 do not match the ADHS 2000 and 2005 point estimates (see Annex C, Fig. C13). The survey sources show significantly lower estimates, at 10 to 20 percentage points below the official estimates of measles coverage.

Fig. 63. Percentage of Armenian children who have been immunized by age 1 year and 2 years for the recommended immunizations, 2003–2008



BCG: bacille Calmette-Guérin vaccine; DPT3: diphtheria, pertussis and tetanus vaccine, third dose; HB3: hepatitis B, third dose; MMR: measles, mumps and rubella vaccine; OPV3: oral poliovirus vaccine, third dose.
Source: NHIAC.

Health information limitations and gaps

- Reporting and monitoring of adverse hospital events, such as surgical site infections, hospital readmissions, etc. would provide a more complete picture of the safety and quality of hospital care. While hospital fatality rate analysis can provide

a general picture of safety and quality trends, by itself it is a crude measure, reflecting not only hospital safety and quality but treatment outcomes and the severity of illness in people when they are admitted to hospitals.

- There are significant discrepancies in immunization estimates between those from officially reported statistics and those from the Armenia Demographic and Health Survey (ADHS). For measles coverage, for example, the 2000 and 2005 ADHS estimates are significantly lower – by 10 to 20 percentage points – than the officially reported coverage.

Summary of findings and policy recommendations

Table 9. Findings and policy recommendations: the quality and safety of health care services

Situation	Policy recommendations
Hospital fatality rates have improved somewhat since 2001, indicating that hospital safety and/or quality of care may have improved. Although the percentage of TB cases successfully treated has not changed since 2004, the percentage of total multidrug-resistant cases has dropped from 25% to 20%. Survival rates for breast cancer have increased. On the other hand, the early detection rates for malignant neoplasms have decreased over the last few years.	Establish systematic screening programmes, particularly for breast and cervical cancers, delivered through primary care services as part of standard preventive care. Monitor and ensure access to effective cancer treatments, including surgical care and chemotherapy drugs.
Screening rates for breast and cervical cancer are very low and show essentially no change between 2007 and 2009. These low rates undoubtedly contribute to the low percentage of malignant neoplasms detected in stages I and II.	Establish organized screening programmes as noted above.
The percentage of expectant mothers receiving early prenatal care and the percentage of infants younger than 6 months who are exclusively breastfed have both improved over the last few years, but they remain significantly below established targets.	Ensure that policies deal with any access barriers there may be for prenatal care services, and that informal payments are discourage. While breast feeding is free, better education on its merits would help to promote it.
There are large discrepancies between officially reported immunization rates and the coverage measured by national population-based surveys.	Reconcile immunization results from routine reporting with those from survey sources. The 2010 ADHS will provide updated information for making possible adjustments.

8. RISK FACTORS, HEALTH PROMOTION AND DISEASE PREVENTION

The performance dimension related to risk factors, health promotion and disease prevention contributes significantly to the goal of improving health status by helping people stay healthy and avoid disease. Sustained improvement in population health indicators, such as increased life expectancy or reduced mortality and morbidity due to cardiovascular and respiratory diseases, depends in the long run on increases in healthy lifestyle behaviours. Three primary policy questions focus on health system performance in this area.

1. What do the prevalence of behavioural and biological risk factors tell us about future health trends?

2. Are health promotion services successful in raising the awareness of the population?

3. Is there improvement in the environmental conditions that affect health status (water, sewage, waste and air quality)?

Behavioural and biological risk factors

The 2007 and 2009 HSPA surveys provided data on several behavioural and biological risk factors that are known to have an impact on health status:

- the percentage of adults who are overweight, defined as having a body mass index (BMI)[9] higher than 25.0;

- the percentage of males who are daily tobacco users (since tobacco users are predominantly males in Armenia, only the rate for males was addressed);

- the percentage of adults who are physically inactive, defined as those who engage in light physical activity less than 30 minutes per week;

9 The body mass index is calculated as (weight in kg)/(height in cm)^2.

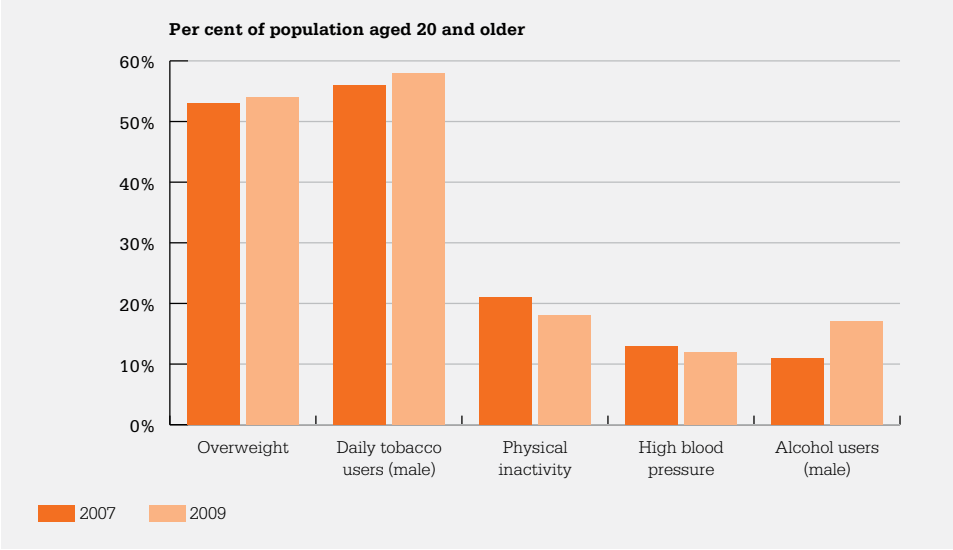
- the percentage of adults with high arterial blood pressure, defined as being at least 140/90 mmHg; and

- the percentage of males who consume the daily equivalent of 20 g or more of pure alcohol.

Comparisons of these risk factors for 2007 and 2009 have been limited in this chapter to the population age 20 years and older.[10] However, when the prevalence of risk factors is analysed by age group, results for the group age 15–19 have been included for 2009.

In terms of assessed risk factors, there was very little change in results between 2007 and 2009 (Fig. 64). The percentage of adults who are physically inactive and the percentage with high blood pressure show some improvement. These improvements are very small, but they are statistically significant ($p<0.05$). On the other hand, the percentage of males who consume the daily equivalent of at least 20 g of pure alcohol has increased (also statistically significant at $p<0.05$).

Fig. 64. Prevalence of health risk factors among Armenians age 20 and older, 2007 and 2009



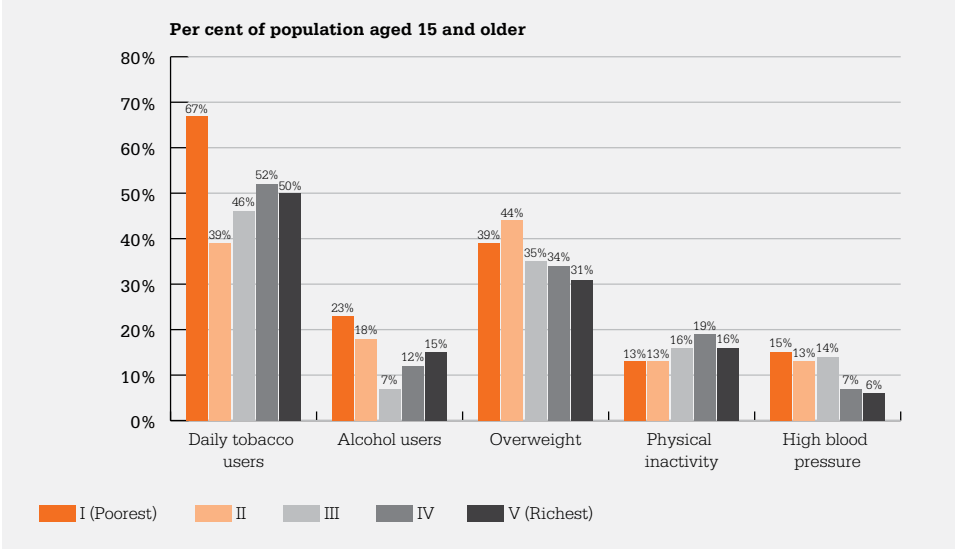
Sources: HSPA 2007 and 2009.

10 The comparisons are limited to the population 20 years and older because the 2007 HSPA survey included only that population group.

The following section reviews the 2009 results for each of the risk factors by wealth quintile, age group and sex. It also presents international comparisons for tobacco and alcohol use.

Fig. 65 shows the relationship between the prevalence of risk factors and wealth quintile, where I is the poorest quintile and V the wealthiest.

Fig. 65. Prevalence of risk factors among Armenians age 15 and older, by wealth quintile, 2009



Note: The prevalences for tobacco and alcohol use refer only to males.
Source: HSPA 2009.

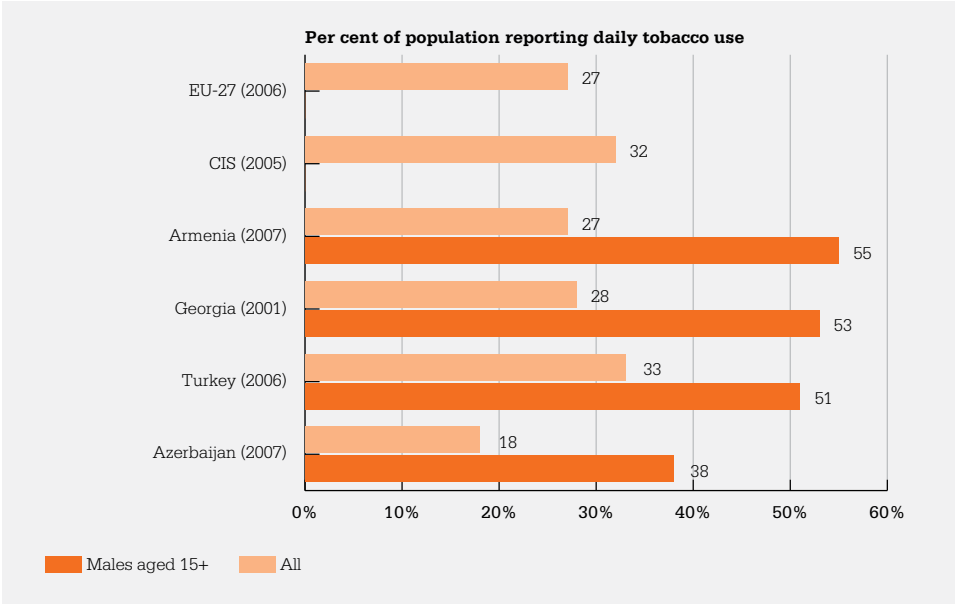
Prevalence of tobacco use

There was not any significant change in tobacco use among males age 20 and over between 2007 and 2009. The highest and lowest percentages of daily tobacco users comprise the two lowest wealth quintiles – the lowest wealth quintile has the highest prevalence of tobacco users, at 67.1%, while quintile II has the lowest prevalence, at 38.9%. The rates for the other three quintiles are all closer to 50%. Among males, the rate of tobacco use is very low in the 15–19 age group (5.3%), but for age groups in the 20–59 span, the rates are close to or above 60%. The rate declines for men age 60 and older. Given the significant transition to tobacco usage among young men during

their late teens and early twenties, strategies to change smoking behaviour should focus on preventing young men from starting to smoke.

As shown in Fig. 66, based on the most recent data available, Armenia has the highest rate among its neighbours for smoking among males age 15 and older. The rate for this group is also among the highest in Europe *(30)*.

Fig. 66. Prevalence of smoking in the general population age 15 and older and among males age 15 and older, selected countries and country groups, most recent year available



CIS: Commonwealth of Independent States, ER-27: see description on p. 22.
Source: WHO Regional Office for Europe, 2009 *(9)*.

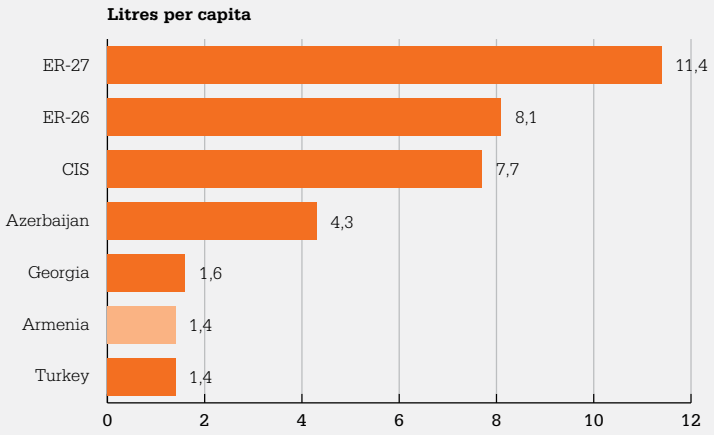
Prevalence of alcohol use

High rates of alcohol use are defined as the average daily consumption of 20 grams or more of pure alcohol. In Armenia, rates of high alcohol use are a problem essentially only among the male population. The prevalence among males is 14.9% and among females only 1.8%. By age group, for males, the highest prevalence is in the 40–49 age group at 27%, and drops close to 20% for men age 50 to 69. High alcohol use in younger and older age groups is less common.

Males in the poorest wealth quintile have the greatest prevalence of high alcohol use, 23%. The prevalence gradient with respect to wealth is U-shaped, being lowest among those in the middle quintile. Prevalences in the wealthiest quintiles (IV and V) are higher than in the middle quintile, but still lower than those in the poorest quintiles (I and II).

International data for alcohol consumption are available only for the year 2003 and are expressed as the average annual per capita alcohol consumption, rather than as prevalence of alcohol use. As Fig. 67 shows, Armenia is tied with Turkey for the lowest average consumption among its neighbours.

Fig. 67. Annual pure alcohol consumption per person age 15 and older, selected countries and country groups, 2003



CIS: Commonwealth of Independent States; ER-27: see description on p. 22.
Source: WHO Regional Office for Europe, 2009 *(9)*.

Prevalence of being overweight

For studying the prevalence of being overweight or obese among adults, individual height and weight measurements were taken during the data collection for the 2007 and 2009 HSPA surveys. These measurements were used to calculate body mass index; a person with a body mass index of 25.0 or more was defined as overweight. There was not a significant change in the prevalence of being overweight among adults between 2007 and 2009. In 2009, among men the prevalence of being overweight is

51.8%, and among women it is 45.8%. The prevalence also increases with age; for the 15–19 age group it is 13.5%, while for age groups older than 40 it is close to or over 65%.

The prevalence of being overweight is greatest in the two poorest wealth quintiles – 38.6% in quintile I and 43.7% in quintile II – and least (30.7%) in the richest quintile.

Prevalence of high blood pressure

For studying the prevalence of high arterial blood pressure, measurements were taken directly from consenting adults during the 2007 and 2009 HSPA surveys. The results showed a small but significant decrease in the prevalence of high blood pressure (defined as greater than 140/90 mmHg) in the two years between surveys (13.4% to 11.9%). In 2009, high blood pressure was more prevalent among females (11.7%) than males (9.4%). The prevalence of the condition also increases markedly after age 40, being roughly 10% for adults age 40–49, close to 20% for those age 50–59 and over 40% for those age 60 and older. The prevalence was highest in the poorest wealth quintile (15.2%), decreasing to 5.8% in the richest wealth quintile.

Prevalence of physical inactivity

There was a small but significant decrease in the prevalence of physical inactivity from 2007 to 2009 (20.7% to 17.5%, respectively) for the population age 20 and older. Results from the 2009 survey show that 17.5% of the population age 15 and over are physically inactive (less than 30 minutes per week of light exercise). This percentage is higher for females (22.3%) than for males (10.4%). As expected, the percentage of the population who are physically inactive increases with age. For adults age 15 to 59 years, the share remains in a range roughly between 10% and 15%. However, for those age 60–69 years, physical inactivity increases to 29.3%, and for those age 70 and over it increases to 42.6%. There are not large differences among the wealth quintiles. The two lowest levels of inactivity are for quintiles I and II (the poorest quintiles) with approximately 13%. The highest prevalence is for quintile IV at 18.6%, while for the other two quintiles (III and V) it is close to 16%. Individuals in the poorer quintiles may be more likely to be engage in physical labour and thus less sedentary.

Health promotion

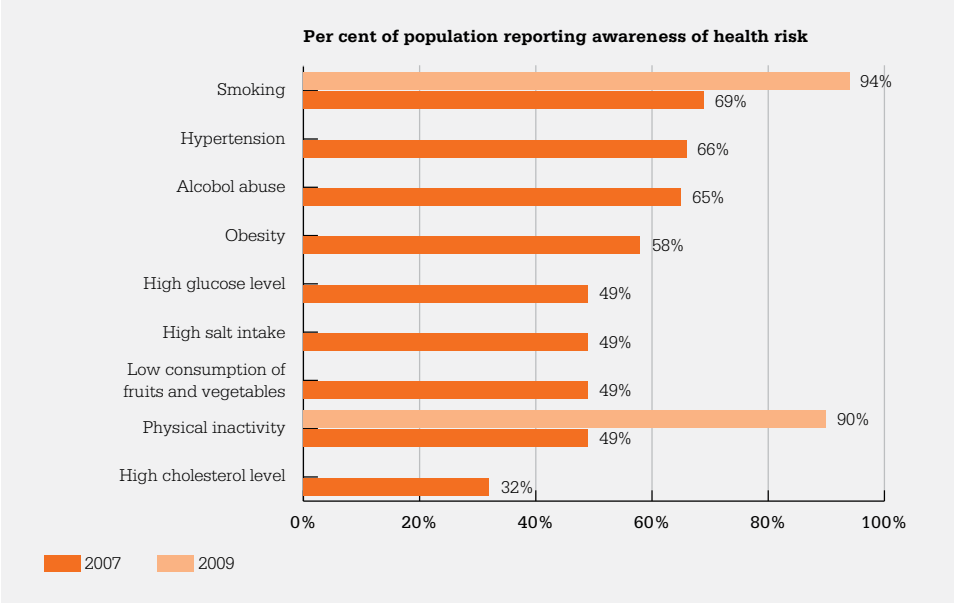
Public awareness of risk factors and healthy behaviours are preconditions for changing behaviour and for prevention and early detection of disease. For Armenia, the 2007 and 2009 HSPA surveys provide several relevant indicators:

- level of awareness about behavioural and biological risk factors;
- level of awareness of conditions (e.g. high blood pressure, high cholesterol levels and high glucose levels) that put individuals at risk for health problems such as diabetes or cardiovascular diseases; and
- level of awareness about communicable diseases (e.g. HIV and TB).

Awareness of behavioural and biological risk factors

Analysis of the HSPA 2007 and 2009 survey data shows that roughly half of the population is generally aware of the major risk factors that contribute to noncommunicable diseases. For the risk factors that are covered by the 2009 survey results – smoking and physical inactivity – the level of awareness appears to have increased (Fig. 68). These results would indicate that health promotion activities have had some success in raising awareness. However, the risk factor results reported earlier in this chapter show that the prevalence of behaviours such as smoking, physical inactivity and alcohol use remains high and has changed little or not at all over the past two years.

Fig. 68. Per cent of population age 20 and older who are aware of health risk factors, 2007 and 2009



Sources: HSPA 2007 and 2009.

Awareness of conditions signifying increased risk for noncommunicable diseases

The HSPA 2009 survey provides information about biological risk factors such as prevalence of arterial high blood pressure and high levels of cholesterol and glucose.

Arterial blood pressure. Close to 63% of respondents say they are aware of their own arterial blood pressure, and 20.7% of the respondents report that a medical professional told them that they have high blood pressure (versus only 11.9% among those tested in the 2009 HSPA survey).

Cholesterol and glucose level. Blood cholesterol level has been measured at least once for 12.2% of adults; of them, 19.6% have been told by a medical professional that their blood cholesterol is high.

Blood glucose level has been measured for 16.5% of adults, and of them 12.1% have been told by a physician that their glucose level is above the norm.

It is worth noting that a significant portion of the population have their own sphygmomanometers for self-measurement of blood pressure, as they can be obtained without a physician's prescription. However, cholesterol and glucose measurements require a visit to a physician; moreover, these tests would only be ordered when the physician determines a specific need and not as part of a general screening or health assessment.

Awareness of communicable diseases (HIV and TB)

Results from the HSPA 2009 survey show a fairly high level of general awareness of HIV and TB (Tables 10 and 11). On the other hand, the results also highlight some misperceptions about these diseases and their transmission modes that could interfere with effective treatment of diagnosed individuals, particularly those living with HIV. General awareness of communicable diseases such as HIV and TB must be accompanied by a deeper understanding of the means of transmission and of appropriate, effective ways to avoid exposure.

Table 10. Per cent of population indicating awareness of aspects of HIV, 2009

% who have heard of HIV/AIDS[a]		91.8
% whose main source of information about HIV is:[b]	television	82.7
	medical professionals	1.1
	posters and billboards	0.5
% who know that HIV:	is incurable	72.8
	is communicable	89.4
	cannot be transmitted through the air	74.7
	cannot be transmitted through a handshake	76.6
% who know someone who died from HIV		2.4
Attitudes towards people living with HIV	% who feel that information about HIV status should be concealed from public	12.7
	% who would advise family members to not befriend someone with HIV	77.4
	% of married people who have discussed HIV with their spouses	24.3

a The percentages in the rest of the table refer only to these respondents who have heard of HIV/AIDS.
b The percentage indicating "other" or "no response" is not shown.
Source: HSPA 2009.

In addition to HIV, 59.9% of the respondents indicated being aware of other sexually transmitted diseases.

Table 11. Per cent of population indicating awareness of aspects of TB, 2009

% who have heard of TB[a]		91.8
% who say their main source of information about TB is:[b]	television	74.8
	medical professionals	4.6
	posters and billboards	0.9
% who believe that TB:	was incurable in the past	43.7
	is presently curable	34.6
	is presently incurable	9.7
	is communicable	83.6
	can be transmitted through air	72.3
	can be transmitted through a handshake	39.0
% with a household member who has been a TB patient		1.3
% who would advise family members to not befriend someone with TB		82.1
% who say that the place to seek treatment if they suspect TB is a:	TB dispensary	34.5
	hospital	47.5
	primary care facility	15.2
	private physician	2.7

a The percentages in the rest of the table refer only to these respondents who have heard of TB.
b The percentage indicating "other" or "no response" is not shown.
Source: HSPA 2009.

Domestic risk factors

Domestic risk factors relate to environmental factors that have an impact on population health, such as access to clean water, sewage and waste disposal facilities, and air pollution. The 2009 HSPA survey included questions on the location of drinking water faucets, location of toilet facilities, waste disposal, presence of sewage, apartment heating, waste collection and ambient air quality. Indicators for the source of

drinking water and opinion of air quality are presented below. Selected results for the prevalence of other domestic risk factors are also discussed.

Source of drinking water

The location of drinking water source varies considerably with geography (Table 12). In close to 80% of households, it is located within the residence; that percentage is almost 100% in Yerevan and more than 90% in other urban areas, but below 45% in rural areas. For most of the remaining rural respondents, the drinking water source is in their own backyard, though 4.5% reported that they did not have a drinking water faucet. More than half of the households in Yerevan, 21.8% of households in urban areas and 48.2% of households in rural areas reported having a 24-hour supply of drinking water (results not shown). About 21% of urban and rural households have access to a source of drinking water less than three hours per day.

Table 12. Sources of drinking water, 2009

	Yerevan	Urban	Rural	Total Armenia
Inside respondent's apartment/house	99.3%	91.5%	43.4%	78.3%
In respondent's own back yard	0.5%	4.0%	47.0%	17.1%
In a common back yard	0.0%	1.2%	2.1%	1.1%
Outside the back yard	0.0%	3.1%	3.0%	2.0%
Do not have a drinking water faucet	0.2%	0.2%	4.5%	1.6%
Total	100.0%	100.0%	100.0%	100.0%

Source: HSPA, 2009.

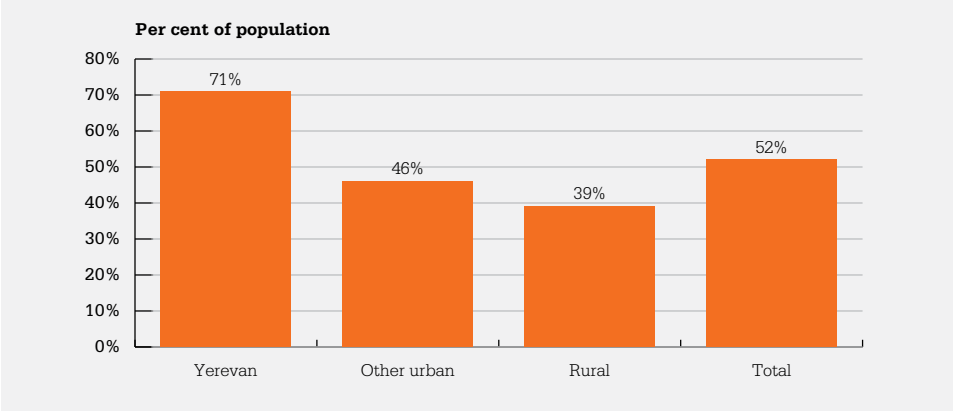
Air quality

Based on survey responses, Armenians regard air pollution as a serious problem. The ambient air was considered polluted by 51.7% of all respondents, including 70.6% of respondents in Yerevan (Fig. 69).

Residents consider motor vehicle emissions (62.3%), dust (21.2%) and uncollected waste (11.3%) to be the main sources of air pollution in Yerevan. In other urban areas, the main sources reported are dust (42.7%), vehicle emissions (19.0%), nearby industrial enterprises (16.6%) and fuel smoke during the winter season (13.7%). The main air

pollution sources in rural areas are dust (33.5%), followed by fuel smoke during the winter season (28.1%) and uncollected waste (18.9%).

Fig. 69. Per cent of population with negative assessment of air quality, by residential location, 2009



Source: HSPA, 2009.

Other domestic risk factors

The toilet is located in the backyard for 12.7% of urban households and 78.1% of rural households. Less than 1% of households reported using a shared toilet facility, although some reported that they did not have a toilet facility. In rural areas, 32.6% of the households do not have access to a sewage system.

There is essentially no use of centralized heating systems for apartment heating. In Yerevan, the percentage of households using personal heating systems, gas heaters or electric heaters are each close to 30%. In other urban areas, the majority of households use gas heaters (65.4%) for apartment heating, while 15.8% use firewood or coal. In rural areas gas heaters are also a main source of heating (42.3%); however, use of firewood and coal in these areas reaches 37.9%. The third most widespread heating source in rural areas is manure (10.9%).

The survey did not identify use of any spontaneously organized dumpsites in Yerevan; however, waste disposal is a serious problem in rural areas, where almost half the households (49.2%) use such dumpsites. Thirty per cent of respondents in Yerevan reported that the waste from their garbage chutes is collected on a daily basis. However, 16.1% of households in Yerevan reported that waste collection from chutes

or other pre-collection points is carried out only once a week or less frequently. This rate was 28.2% in urban and 70% in rural areas. In rural areas, 23.5% of respondents noted that there is no waste collection at all, as did 2.2% of the respondents from urban areas (excluding Yerevan).

Health information limitations and gaps

- The risk factor results originate almost exclusively from the HSPA surveys. Although similar risk factor data are available from ADHS (2000 and 2005), the target population and the measurement methods are not comparable.

- Small sample sizes do not produce robust estimates and do not permit the assessment of subnational differences.

Summary of findings and policy recommendations

Table 13. Findings and policy recommendations: risk factors, health promotion and disease prevention

Situation	Policy recommendations
Risk factors are included in both HSPA surveys and ADHS surveys. However, due to differences in target populations and methods, results from the two sources cannot be compared to obtain more information about trends. Additionally, the small sample size does not allow the data to be disaggregated by marz.	Harmonize the HSPA survey sampling design and questionnaire with other surveys (especially the ADHS) such that measurements are comparable. For the 2010 ADHS, investigate the feasibility of adding biomarkers to measure for the adult survey, for example, blood glucose and cholesterol levels. Consider focusing on adult health by screening for cancers, etc. Design survey samples to be representative of subnational areas (e.g. the marzes) in order to assess and address geographic differences in lifestyle and in domestic and environmental risk factors.
A high percentage of the population engages in risky lifestyle behaviours, especially smoking among men and unhealthy eating patterns that have led to being overweight in almost half the adult population. The prevalence of poor lifestyle choices is concentrated among households in the poorest wealth quintiles. Unless aggressively addressed, this pattern will have significant long-term implications for the health status of people with relatively limited means and could pose a significant challenge to Armenia's health system. Awareness of risk factors has not led to behaviour change. Better diagnoses of those who are particularly at risk due to high cholesterol, high blood pressure or high glucose levels may encourage some behaviour change.	Organize healthy lifestyle campaigns to promote eating moderately and well and engaging in regular physical activity. Messages should be directed at both sexes and all age groups. In addition, anti-smoking interventions should be targeted especially to those in their late teens and early twenties, to discourage them from starting to smoke.
Access to adequate water sources and sewage facilities are not a problem in Yerevan and other urban areas. However, many households in rural areas have poor sanitation facilities and no waste collection.	Dedicate efforts to improve water and sanitation conditions in rural areas.
Without quantifiable measures of air pollution, it is difficult to provide an objective assessment of the risk that air pollution poses to health in Armenia. However, a significant portion of the population believes that air quality is a problem, and it may contribute to or aggravate respiratory conditions.	Look into conducting air and water quality tests as part of a survey. Consider asking adults about respiratory issues related to pollution, e.g. exacerbation of asthma.

9. HEALTH SYSTEM RESPONSIVENESS

Making a health system more responsive to the expectations of the population it serves is one of the three ultimate goals of any health system, along with improving health and ensuring fairness in financing. The relevant policy question for this dimension of system performance is whether the health system is responsive to the needs and demands of the Armenian people.

Health system responsiveness reflects its performance and the extent to which patients are satisfied with different aspects of the health care services they have received. Indicators of responsiveness can be derived from population-based surveys. The 2007 and 2009 HSPA surveys asked questions about four domains of responsiveness during recent health care visits.

1. *Dignity*. Did health care providers show respect for patients, and were physical examinations conducted in a private setting?

2. *Communication*. Did health care providers explain to the patient his or her situation, diagnostic tests and treatments? Did the provider provide the patient with an opportunity to ask questions and discuss matters of concern related to the disease?

3. *Confidentiality*. Did the patient feel assured that his or her medical history was kept confidential? Were there opportunities to have a conversation with health care providers that could not be overheard by others?

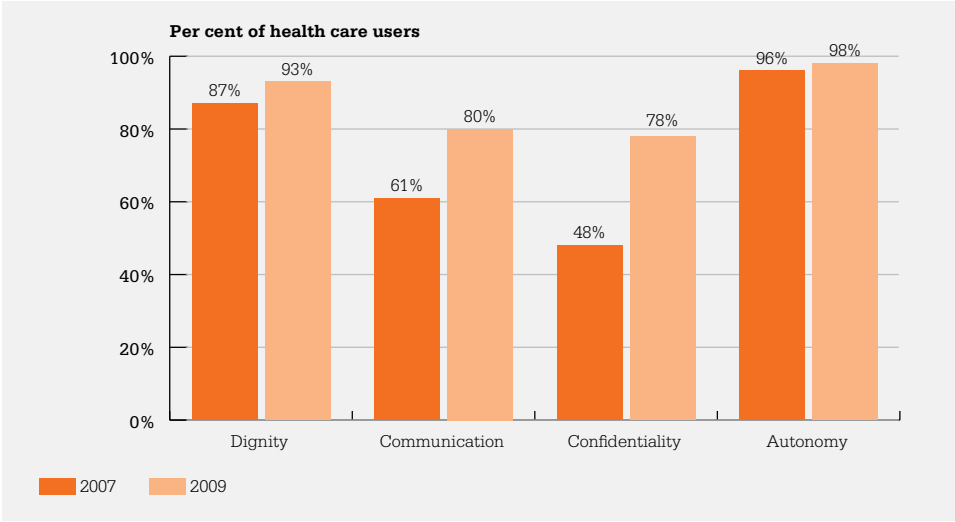
4. *Autonomy*. Did health care providers adequately explain the treatment options? Were patient opinions considered in deciding on the course of treatment?

Note that these measures of responsiveness pertain only to users of health care services, meaning those who access services. One of the most important elements of health system responsiveness is therefore not captured at all: patients' ability and/or willingness to access services. In short, a system that cannot be accessed cannot be considered responsive. For example, according to the 2005 ADHS *(31)*, most women (89%) reported that at least one factor or circumstance posed a major obstacle to accessing health care services. The most commonly perceived barrier to their access was financial; two thirds of respondents (66%) felt that paying for treatment was a

major problem, and one quarter (26%) cited the cost of transportation. Others reported barriers associated with quality of care: more than half (58%) reported that poor service is a significant problem, and 44% cited concern that the provider might be unfriendly.

For those people who did access services, Figure 70 shows that many health care users responded positively to the questions listed above for the four domains of responsiveness. Scores for all four domains improved between 2007 and 2009. The two domains that had the lowest scores in 2007 – communication and confidentiality – show the most marked improvement in 2009, with about 80% of respondents indicating that providers communicated well and that their confidentiality had been respected. The scores for dignity and autonomy remained at high levels and were both above 90% in 2009.

Fig. 70. Percentage of Armenian health care users who rate given aspects of system responsiveness positively, 2007 and 2009



Sources: HSPA, 2007, 2009.

The time a patient spends waiting in medical facilities before seeing a physician is one aspect of responsiveness that can be objectively measured. A question about waiting time[11] was included in the 2009 HSPA survey. The average waiting time was 10-15 minutes. Ninety per cent of respondents indicated that they waited less than 30 minutes. In the absence of any trends and targets for waiting time, it is not possible to assess performance. However, the indicator could be formally included in assessing primary health care reforms, for example.

It should be noted that, except for waiting time, the measures of responsiveness are difficult to measure reliably. More reliable measures might be obtained from in-depth patient surveys, using various approaches, including the collection of qualitative information, to understand nuances.

Responsiveness of primary health care reforms

The implementation of primary health care reforms provides an opportunity to track improvement in responsiveness in this area. One objective of the primary health care strategy is to introduce the principle of free selection of one's primary care providers. Results from the 2009 HSPA survey provide some preliminary information about what might be important in measuring the responsiveness of these reforms. For example, 75.6% of those surveyed were aware of their right to freely choose a physician. Of those who had signed primary health care contracts, most respondents indicated they received explanations of their right to freely choose another facility (88.9%) or another physician (86.2%).

11 The question used was "Approximately how long did you wait in the medical facility before seeing a doctor?"

Summary of findings and policy recommendations

Table 14. Findings and policy recommendations: health system responsiveness

Situation	Policy recommendations
Scores for the measures of responsiveness are favourable and have improved since 2007. However, there are several caveats to bear in mind regarding their interpretation. They are noted below, together with recommendations for improving the measurement of responsiveness.	Consult with focus groups to determine key expectations and to develop relevant concepts of responsiveness. These consultations can support a framework for improving the measurement of health system responsiveness.
The current measures available reflect only the perceptions of health care users. They do not cover would-be users who were unable or unwilling to access services.	Include questions in the 2010 ADHS on why persons do not access services, and make sure that they are compatible with the 2005 survey questions.
One-dimensional quantitative measures from small population-based surveys are not adequate for capturing highly theoretical, sensitive concepts such as "dignity" and "autonomy".	Validate the quantitative survey measures of responsiveness with more reliable information. For instance, patients could be surveyed immediately after they encounter medical personnel. Such a survey could include a series of questions from which an index could be constructed for complex concepts such as communication, dignity, etc. Qualitative information could also be collected from patients for detailed analysis.
There is likely to be considerable heterogeneity in responsiveness, depending on the type of provider (hospital, health centre, etc.), the management of the facility (public or private), and the location of the facility. None of these "equity-type" measures were available for a more thorough assessment.	To better understand and address responsiveness issues, more refined measures are needed at the subnational level, and by provider type. The methodology for data collection should provide for this kind of equity analysis.

10. IMPROVEMENT IN HEALTH STATUS

"Better health" is the main objective of a health system, and hence its defining goal. Instrumental health goals are pursued as a means to achieving better health, as well as to improving the two other health system goals – enhancing system responsiveness and ensuring equity in financing *(8)*. The instrumental health system goals and the performance dimensions related to them – such as access to services and the quality and safety of care – have been reviewed in previous chapters, as have the other two health system goals. This chapter assesses health system performance against the defining goal of improving health status, providing an opportunity to consider how the instrumental goals are or are not associated with better health. There are two policy questions for assessing this goal.

1. Are the level and distribution of health status among the population improving? This policy question addresses not just improving the average level of health, but also the extent to which improvement in health is shared among all individuals, regardless of geographic or socioeconomic differences.

2. What are the main patterns of disease incidence and prevalence?

The level and distribution of health status

The health status of the Armenia population is assessed in this report by using these indicators:

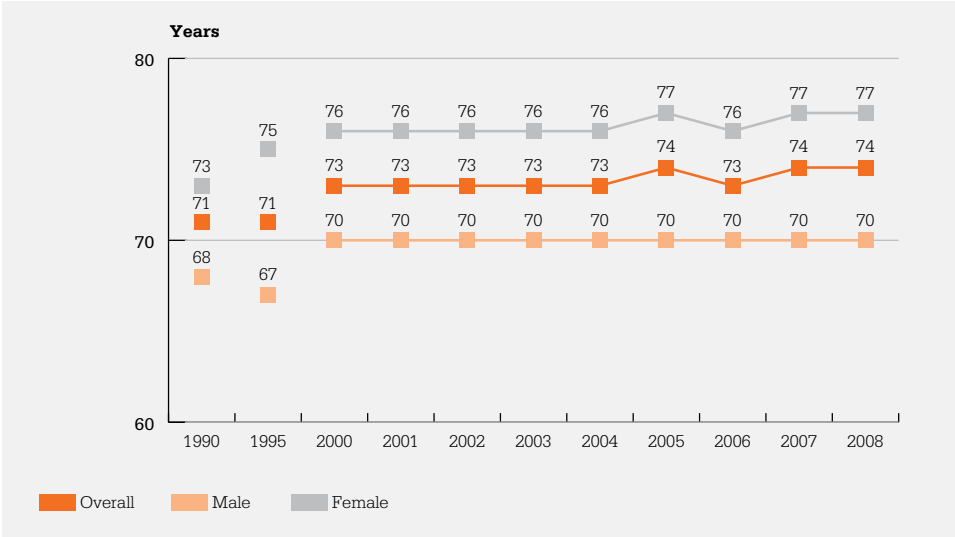
- life expectancy
- individual self-assessment of health
- child, infant and neonatal, and maternal mortality.

Life expectancy

The average life expectancy at birth essentially did not change in Armenia between 2004 and 2008 and has remained between 73 and 74 years (Fig. 71). Compared to

1990, however, life expectancy increased by 3.1 years by 2008. This increase is due mainly to the decrease in the child mortality rate, which has a significant impact on life expectancy at birth. (In 2008, child mortality was 10.8 per 1000 live births, while in 1990 it had been 18.5 per 1000). Female life expectancy has exceeded that for males by 5–6 years over the past decade, with some indication that the gap may be widening.

Fig. 71. Life expectancy at birth, 1990, 1995 and 2000–2008

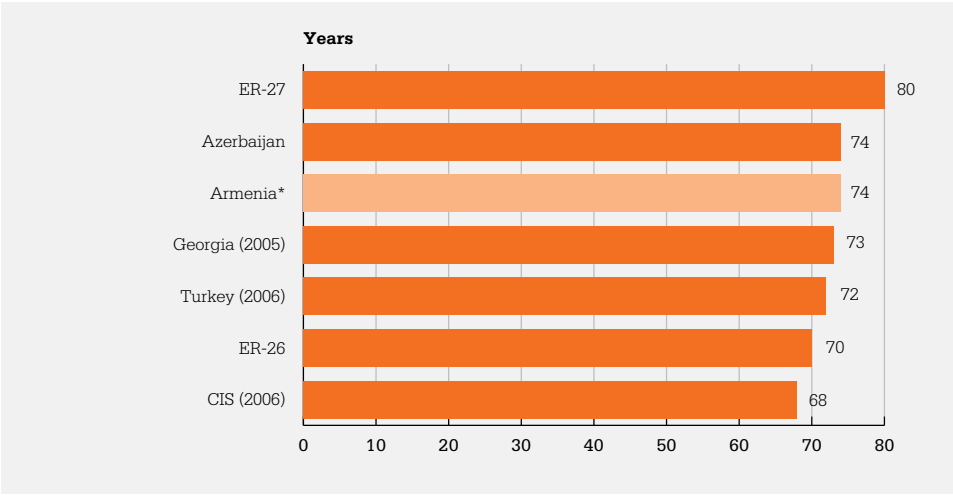


Source: NSS.

Based on statistics published by the National Statistical Service (NSS), Armenia has the lowest life expectancy among its primary neighbours; however, the result is significantly higher than the average for ER-26 countries (Fig. 72). It should be noted that according to WHO estimates, life expectancy at birth is actually lower in Armenia than the officially reported results, likely by four to five years.[12]

12 The life expectancy levels reported by NSS are high compared to WHO estimates; on average, NSS estimates are 5-6% higher, or about four years longer life expectancy at birth. The difference may be due to underreporting of deaths in the vital registration system, and/or an overestimate of the official de jure population in the denominator due to high levels of undocumented emigration.

Fig. 72. Life expectancy at birth, selected countries and country groups, 2007



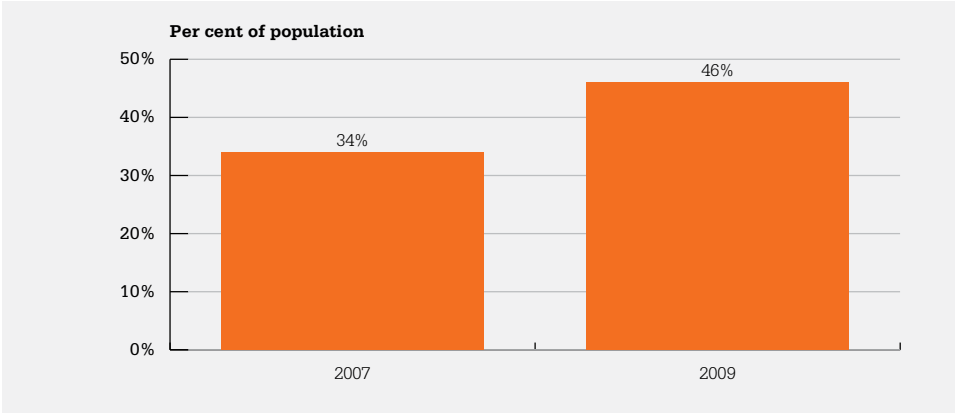
* The European Health for All Database does not include a value for Armenia more recent than 2003, for which it reports a value (not shown here) of 73.1 years.
CIS: Commonwealth of Independent States; ER-26, ER-27: see description on p. 22.
Source: WHO Regional Office for Europe, 2009 *(9)*.

Self-assessed health status

Results for the self-assessment of health status were derived from the 2009 HSPA survey. They show a significant improvement over the previous two years in perceived health status. In 2009, 38.9% of adults assessed their health status as "very good" or "good", up from 27.5% who reported the same assessment in the 2007 survey[13] (Fig. 73)

13 Note that in the comparisons with 2007 survey results, the 2009 results only refer to the population age 20 and older. However, full results for the 2009 survey and stratification by wealth quintile refer to all respondents age 15 and older.

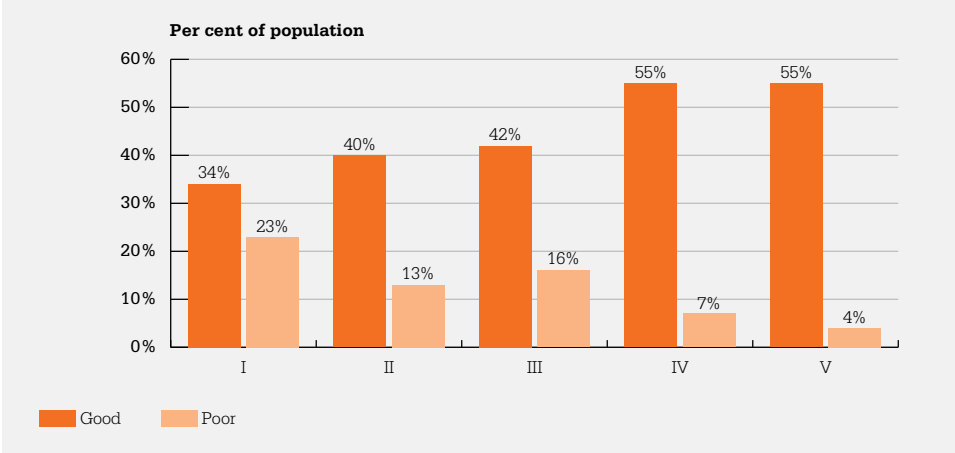
Fig. 73 Per cent of Armenian population rating their health as "very good" or "good", 2007 and 2009



Source: HSPA 2007 and 2009.

However, the results for this indicator vary significantly by wealth quintile. The percentage of people in the richest quintile (V) who describe their health status as "very good" or "good" is 55.2%, while for the poorest quintile (I) it is only 33.9% (Fig. 74). A large difference can also be observed in the percentage of people assessing their health as "poor" or "very poor": in the richest quintile it is 4.4%, while in the poorest it is 23.2%.

Fig. 74. Per cent of population rating their health status as "very good" or "good", and "very poor" or "poor", by wealth quintile, 2009



Source: HSPA 2007 and 2009.

The health self-assessment indicator is also strongly linked to the age of respondents. In the 15–19 age group, 85.9% of respondents assessed their health status as "very good" or "good", while in the 70 and older group the corresponding figure was only 6.7%. The percentage of respondents reporting their health status as "very good" or "good" decreased consistently with increasing age.

Differences in self-assessed health status among Yerevan, other urban areas and rural areas are not significant. In Yerevan, 52.6% of respondents assessed their health status as "very good" or "good", while for other urban areas and rural areas the figures were 50.8% and 49.0% respectively.

The percentage of male respondents who assessed their health status as "very good" or "good" is higher (55.4%) than that of female respondents (46.3%).

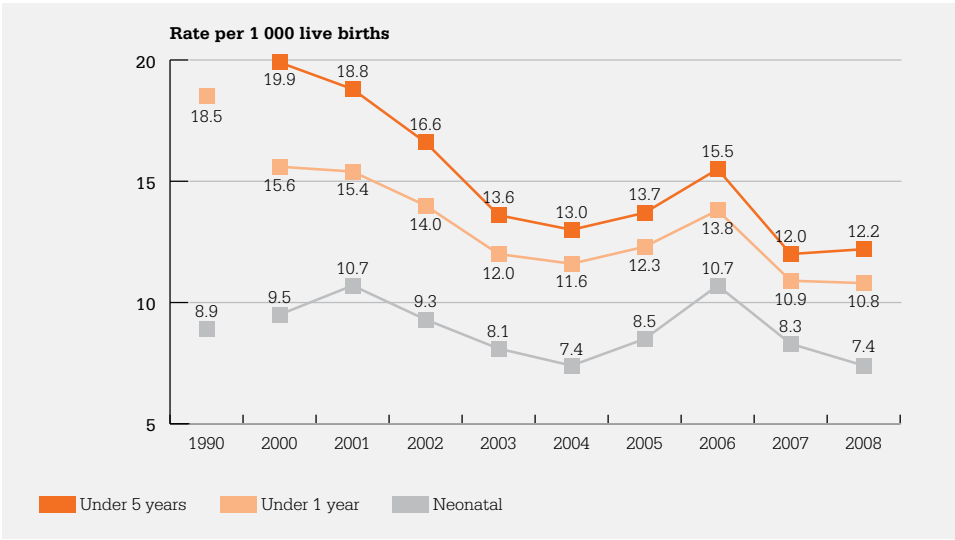
Child, infant and neonatal, and maternal mortality

Child mortality rates and maternal mortality ratios are closely linked to a country's level of socioeconomic development. They are both included among the MDGs *(2)*. For under-five child mortality (which refers to deaths between birth and age 5), the MDG target is to reduce it from its level in 1990 by two thirds by 2015. In Armenia, that translates into a reduction from 24 deaths per 1000 live births in 1990 to 8 per 1000 in 2015. The MDG target for maternal mortality is to reduce the ratio from its level in 1990 by three quarters. For Armenia, that means reducing it from 38.5 maternal deaths per 100 000 live births (the triennial average for 1990–1992) to less than 10 per 100 000 in 2015.

Targets for these measures are also included in the Armenian strategy and programme goals. The Strategy for Improvement of Maternal and Child Health Care for 2003–2015 has targets of reducing infant (age 0–1) and under-five child mortality rates by at least one third. For infant mortality, that means the rate would not exceed 10 deaths per 1000 live births by 2015. The National Programme for Improvement of Reproductive Health for 2007–2015 sets a target for neonatal (0–28 days) mortality at 7 deaths per 1000 live births or fewer, and perinatal mortality at 10 deaths per 1000 live births or fewer.

In general, under-five, infant and neonatal mortality rates have declined since 2000, despite an increase between 2004 and 2006 (Fig. 75). Between 2006 and 2008, under-five, infant and neonatal mortality all decreased by 3.2 deaths per 1000 live births. In 2005, Armenia adopted the WHO standard definition of "live birth", which may partially account for the unusual increase in 2006.

Fig. 75. Child, infant and neonatal mortality rates per 1000 live births, 1990 and 2000–2008



Source: NHIAC.

Table 15. Child mortality rates per 1000 live births, by year

	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008
Under 5 years	24.0*	19.9	18.8	16.6	13.6	13.0	13.7	15.5	12.0	12.2
Under 1 year	18.5	15.6	15.4	14.0	12.0	11.6	12.3	13.8	10.9	10.8
Neonatal[14]	8.9	9.5	10.7	9.3	8.1	7.4	8.5	10.7	8.3	7.4
Perinatal[14]	17.6	16.4	14.8	13.4	13.1	12.1	11.9	14.4	13.4	12.8
Early neonatal[15]	7.5	10.2	11.1	10.7	9.9	9.2	9.6	9.6	7.3	7.2
Stillbirths	10.0	8.3	8.0	7.1	7.9	7.6	7.3	8.6	9.2	9.0

Source: NHIAC; *2005(2).

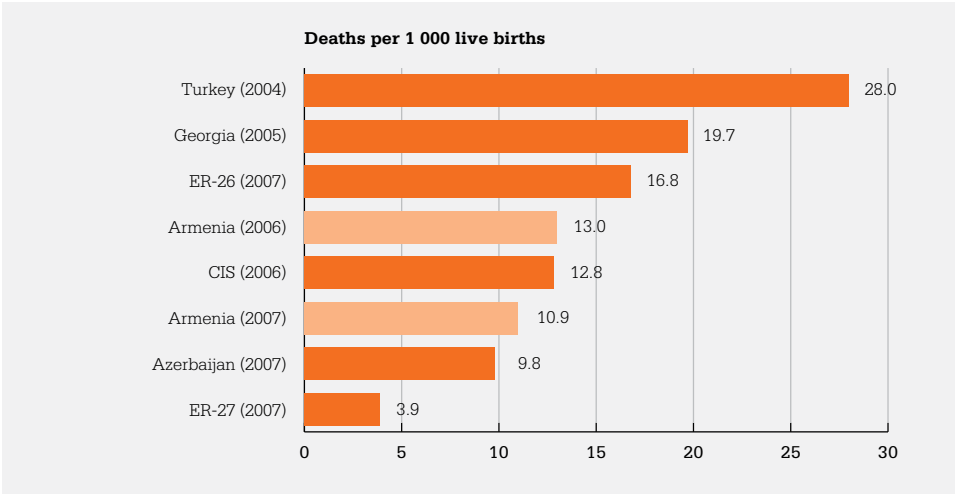
As is the case with life expectancy, official reported results for child, infant and neonatal mortality are consistently different (and in this case lower) than WHO estimates.

14 There are different data on the 2005 neonatal and perinatal mortality rates from the NHIAC and in *National strategy, program and action timetable for the improvement of reproductive health for 2007–2015: Annex 3: basic monitoring indicators*. In the latter document they are 8.2 and 16.4, respectively.

The data quality issues with the official rates are due to probable underreporting of deaths – especially early neonatal deaths, which lead to underestimating the true mortality rates. In addition, although Armenia adopted the international definition of "live birth" in 2005, and this change will result in a higher estimate, the implementation of this definition was not immediate by all reporting sources (see explanation in footnote 15). International comparisons of these mortality rates should keep this limitation in mind.

Armenia generally has a lower infant mortality rate than its primary neighbours, except for Azerbaijan (Fig. 76), and its rate also compares favourably to the average for ER-26 countries. However, the infant mortality rate still remains three times the average for the ER-27.

Fig. 76. Infant mortality rates, selected countries and country groups, most recent year available

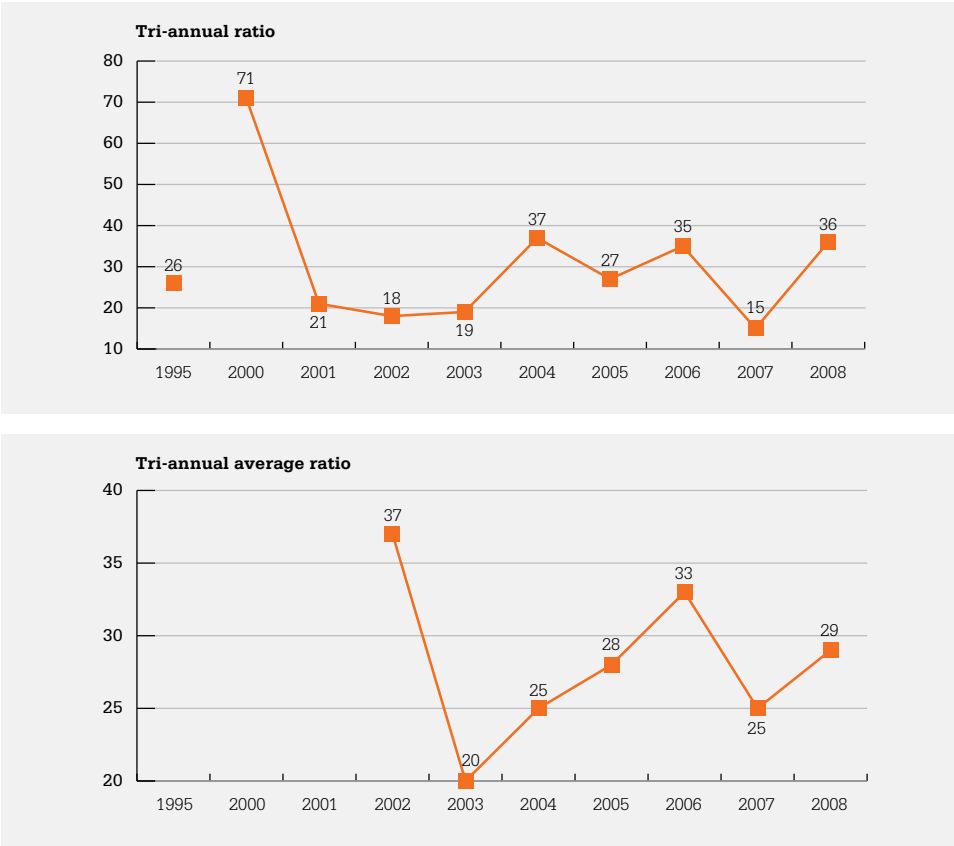


CIS: Commonwealth of Independent States; ER-26, ER-27: see description on p. 16.
Sources: WHO Regional Office for Europe, 2009 (9); *NHIAC.

15 By definition, the neonatal mortality rate is equal to or higher than the early neonatal rate. However, between 2000 and 2005, the early neonatal mortality rates are higher than the neonatal mortality rates due to the methodology of recording such deaths. The early neonatal mortality data are collected by the NHIAC using Reporting Forms N32 and N2, and the hospitals fill in these forms systematically. The more general neonatal mortality data, on the other hand, are registered by the Civilian Registry Offices. The parents of infants who die within their first six days of life often do not register the deaths at the Registry Offices, leading to discrepancies between these two indicators. For instance, in 2005 the NHIAC recorded 363 cases of early neonatal mortality, while the NSS, using data from the Civilian Registry Offices, registered only 320 cases of neonatal mortality. It should be noted that this underestimation will also affect infant and child mortality rates.

The annual maternal mortality ratio per 100 000 live births is extremely variable due to the relatively small number of annual births in Armenia. A change in the numerator of a single event translates into approximately a 2.5% change in the ratio. A triennial moving average of maternal mortality ratios is often used to smooth out the maternal mortality trends; both the annual and the smoothed ratios are presented below (Figs 77 and 78).

Figs 77, 78. Maternal mortality ratio per 100 000 live births, 1995 and 2000–2008



Note: Triennial ratios are shown above the last year of each 3-year period.
Source: NHIAC.

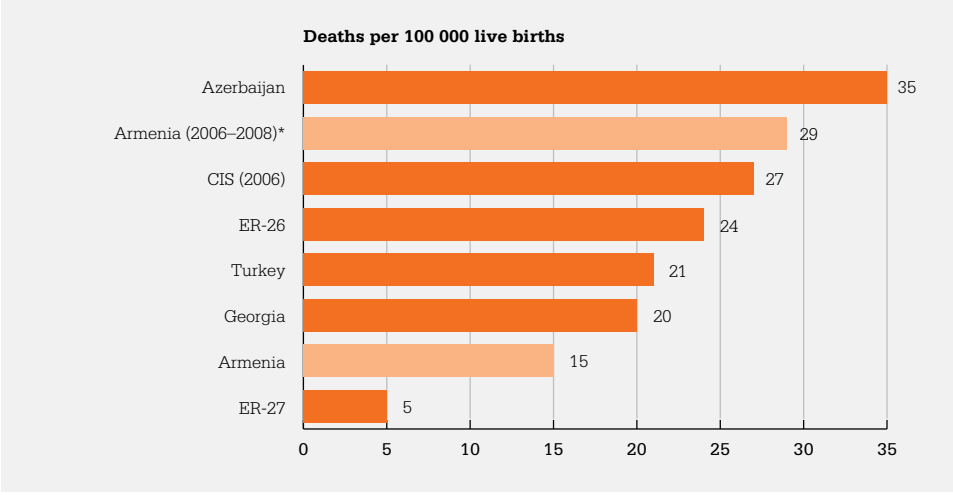
The annual ratio peaked in 2000 at 71.1 deaths per 100 000 live births. This peak also pushed up the triennial ratio for the period 2000–2002. Since 2000, the annual ratio has

been variable but more or less stable between 18 and 37 deaths per 100 000 live births. The triennial ratio increased between 2003 and 2006 but dropped slightly afterwards.

The Strategy for Improvement of Maternal and Child Health Care for 2003–2015 sets a maternal mortality target of 20 per 100 000 live births to be achieved by 2015.[16] This target was met on several individual years between 2002 and 2008, but the triennial averages remained well above 20. Current performance is still much higher than the MDG target of 10 deaths per 100 000 live births by 2015.

Given the instability in annual ratios, international comparisons should be made with caution. Particularly for countries with relatively low numbers of live births, the results can vary markedly from year to year. In 2007 (the latest year for which international annual rates are available), Armenia's maternal mortality ratio was much lower than the ratios in neighbouring countries and the average ratios in the ER-26 and the CIS. Yet its triennial ratio for 2006–2008 was lower only than the annual rate for Azerbaijan (Fig. 79).

Fig. 79. Maternal mortality ratio to 100 000 live births, selected countries and country groups, 2007



CIS: Commonwealth of Independent States; ER-26, ER-27: see description on p. 22.
Sources: WHO Regional Office for Europe, 2009 (9), *NHIAC.

16 *Localization and progress of Millennium Development Goals* was published in 2005 *(33),* while the Maternal and Child Health Care Strategy was adopted on 21 August 2003.

Patterns of disease prevalence and incidence

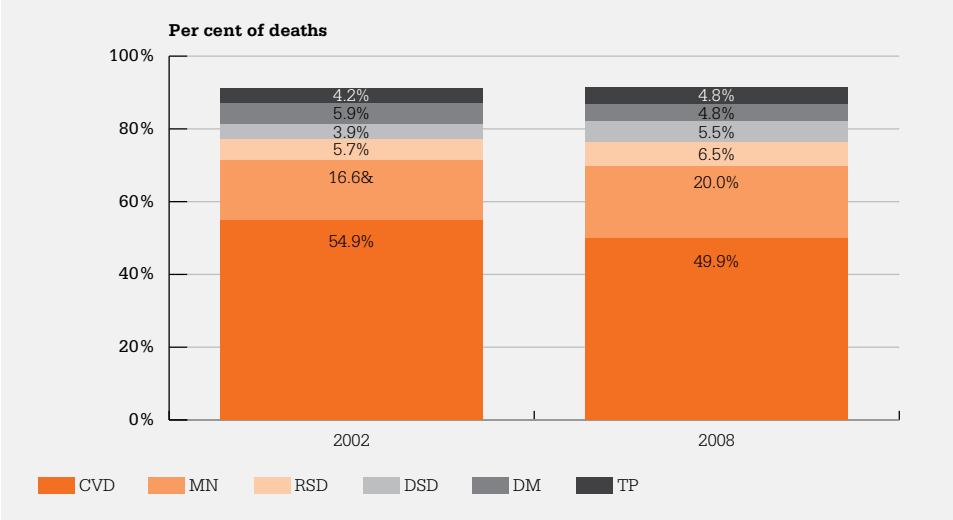
An assessment of the patterns of disease prevalence and incidence can point to the most significant health system challenges for improving population health. The indicators used to answer the policy question about disease prevalence and incidence are:

- the main causes of mortality, and changes in mortality rates over time
- the main causes of morbidity, and changes in morbidity rates over time.

Causes of mortality

Fig. 80 shows the most prevalent causes of mortality in Armenia in 2002 and 2008. The first two among the mortality causes, cardiovascular diseases and malignant neoplasms, account for nearly 70% of all deaths in the country.

Fig. 80. Most prevalent causes of mortality, 2002 and 2008

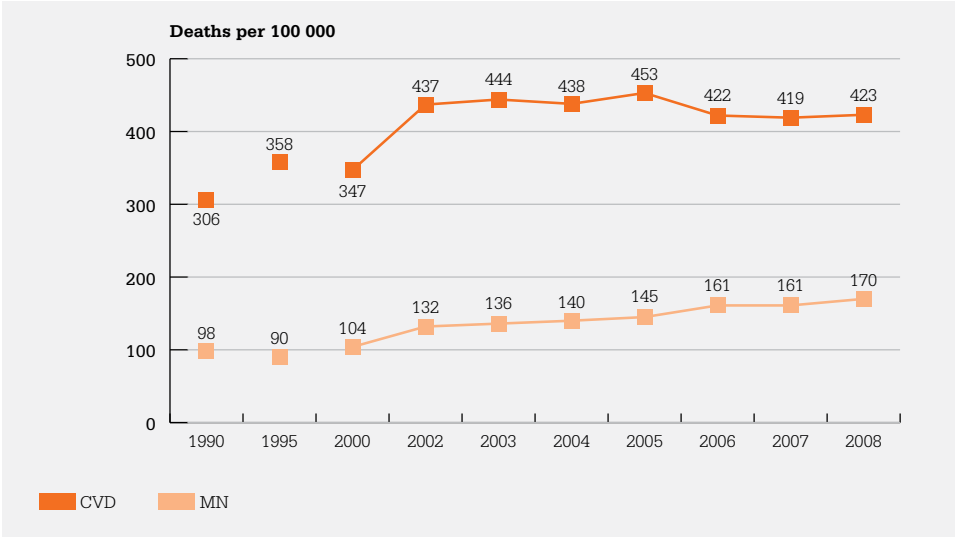


TP: traumas and poisonings
DM: diabetes mellitus
DSD: digestive system diseases
RSD: respiratory system diseases
MN: malignant neoplasms
CVD: cardiovascular diseases (circulatory system diseases)
Source: NHIAC.

There have been some shifts in the relative contributions of these diseases to overall mortality. The percentage of deaths due to cardiovascular diseases decreased from 55% in 2002 to 50% in 2008, while the percentage due to malignant neoplasms increased from 16.6% to 20.0%. Respiratory and digestive system diseases also accounted for a slightly higher percentage of deaths.[17]

Trends in mortality rates per 100 000 population for these diseases are shown in Figures 81 and 82. The mortality rate due to cardiovascular diseases has decreased somewhat since 2005, but it remains significantly higher than the rates reported in 1990 and 1995. The modest declining trend of recent years may be due to increased access to primary care services, enabling earlier detection and treatment, as well as to improvement in the quality of treatment for these diseases.

Fig. 81. Mortality per 100 000 population due to cardiovascular diseases and malignant neoplasms, 1990, 1995 and 2000–2008



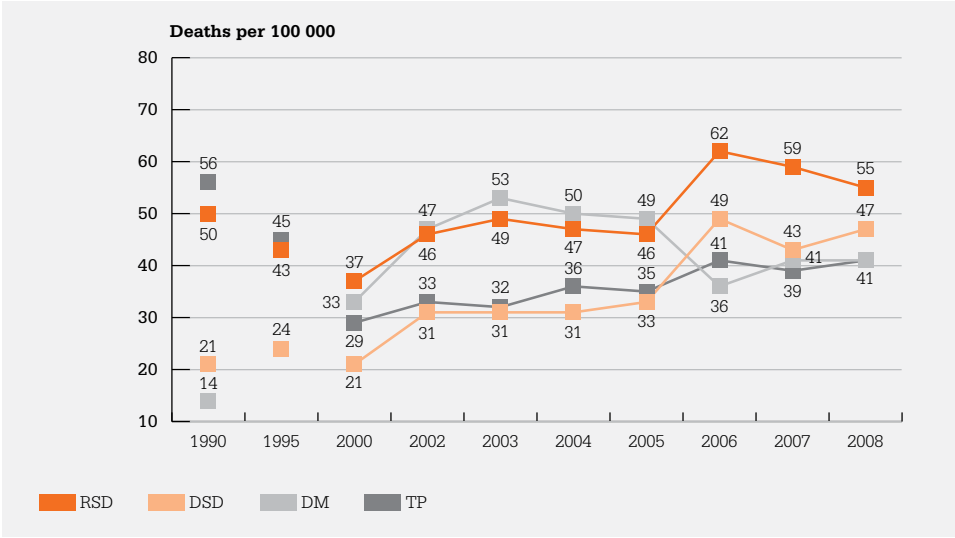
CVD: cardiovascular diseases, MN: malignant neoplasms.
Source: NHIAC.

The mortality rate for malignant neoplasms has increased steadily since 2000 and was 63% higher in 2008 compared to 2000. The trends in mortality rates for the other

17 Armenia currently uses a short list of 229 causes of death, which means information is lost when more detailed causes are "coded up" to a broader cause-of-death category. This practice probably does not affect the relative proportion of the top causes, however.

four main causes of death have varied over the past eight years. However, with the exception of diabetes, their mortality rates are higher in 2008 than in 2002. It is possible that more people with diabetes are able to access treatment, but that hypothesis requires further investigation.

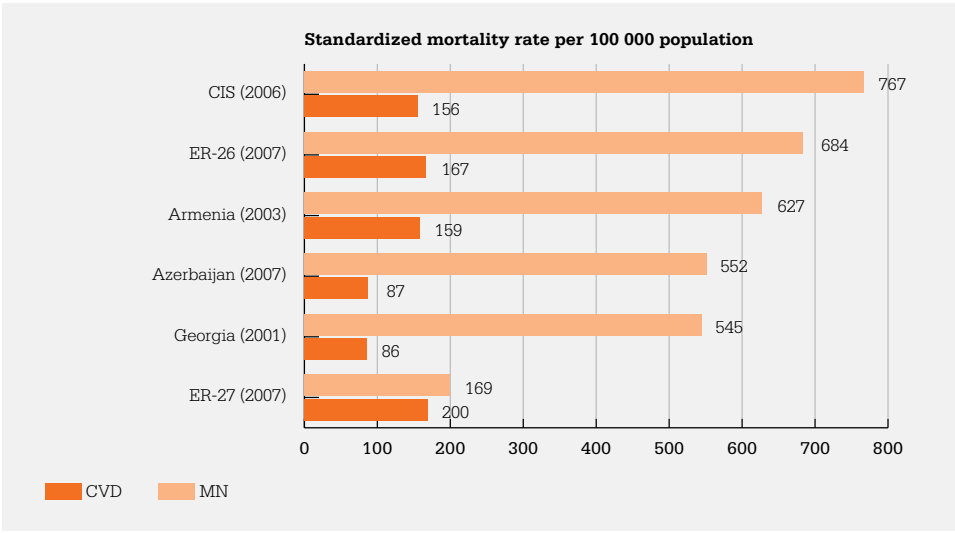
Fig. 82. Mortality per 100 000 population due to respiratory system diseases, digestive system diseases, diabetes mellitus, and traumas and poisonings, 1990, 1995 and 2000–2008



DM: diabetes mellitus, DSD: digestive system diseases, RSD: respiratory system diseases, TP: traumas and poisonings.
Source: NHIAC.

The mortality rates reported above have not been standardized by age and cannot be compared directly to results from other countries. However, the European Health for All Database does report age-standardized mortality rates, and international comparisons of age-standardized rates, and international comparisons of age-standardized rates are shown in Figure 83. Although Armenia's mortality rate for malignant neoplasms during the most recently reported year is similar to that in other countries, its rate for cardiovascular diseases was the highest of the south Caucasus countries.

Fig. 83. Standardized mortality rates per 100 000 population due to cardiovascular diseases and malignant neoplasms, selected countries and country groups, most recent year available



CIS: Commonwealth of Independent States; CVD: cardiovascular diseases; ER-26, ER-27: see description on p. 22; MN: malignant neoplasms.
Source: WHO Regional Office for Europe, 2009 *(9)*.

Causes of morbidity

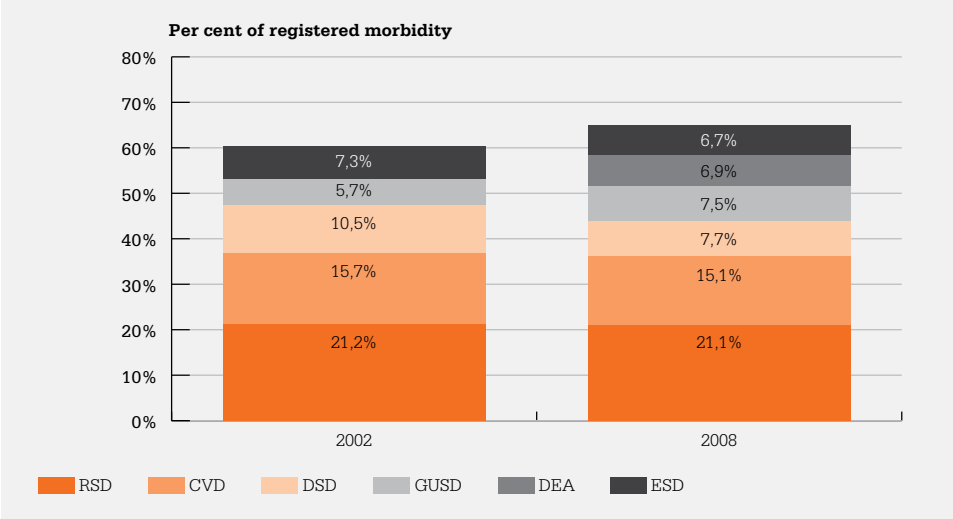
Respiratory system diseases,[18] accounting for just over 20% of all morbidity, were the most prevalent of the major diseases[19] in Armenia in 2008 (Fig. 84). They were followed by circulatory system diseases at 15%, and then by digestive system diseases, genitourinary system diseases, diseases of the eye and adnexa,[20] and endocrine system diseases, each at close to 7% of the total.

18 In 2008, the prevalence of respiratory system diseases was 8015 per 100 000 population, including 632/100 000 for "chronic and unspecified bronchitis, pneumomediastinum", 401/100 000 for "pneumonia", and 5238/100 000 for "other diseases of the respiratory system". Thus, "other" respiratory diseases comprise 65% of the total. To better understand patterns of respiratory system disease and to develop appropriate strategies to address them, it will be necessary to use a more detailed classification of respiratory system diseases

19 The term "disease prevalence" is often used instead of the "general morbidity" term.

20 Diseases of the eye and adnexa only began to be recorded in 2004. Between 2004 and 2008, the prevalence of these diseases rose from 1427/100 000 to 2609/100 000, an increase of 83%. The introduction of this category had a significant impact on the overall structure of disease prevalence between 2002 and 2008.

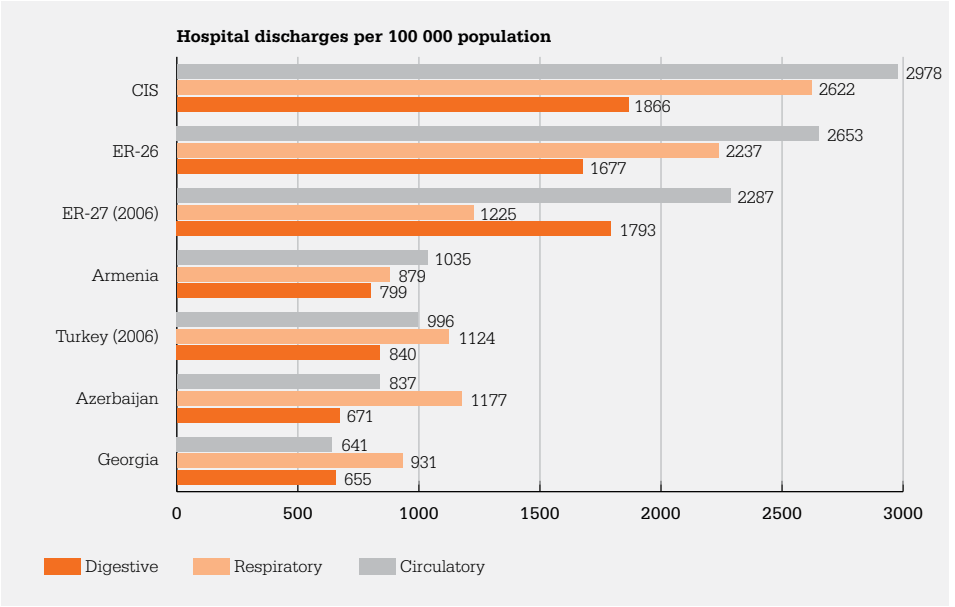
Fig. 84. Most prevalent diseases, 2002 and 2008



ESD: endocrine system diseases
DEA: diseases of the eye and adnexa
GUSD: genitourinary system diseases
DSD: digestive system diseases
CVD: cardiovascular diseases (circulatory system diseases)
RSD: respiratory system diseases
Source: NHIAC.

Although there are no readily available data that would enable direct international comparison of the prevalence of these diseases, Figure 85 presents the results of hospital discharges for major disease categories per 100 000 population for selected countries and country groups. In this comparison, the prevalence rates for Armenia are similar to those for its neighbouring countries, and much lower than the average prevalences for major country groups in the European Region. It must be noted that national hospitalization rates are affected by access to hospital care and hospitalization patterns within each country.

Fig. 85. Hospital discharges per 100 000 population by selected diseases, selected international comparisons, 2007



Source: WHO Regional Office for Europe, 2009 *(9)*.
CIS: Commonwealth of Independent States; ER-26, ER-27: see description on p. 22.

Health information limitations and gaps

A detailed assessment of data quality and comparisons of official Armenian results for mortality-related indicators was prepared for the CHeSS report for Armenia *(10)*. The main data quality issues are as follows.

- *Vital registration data*. A degree of underreporting has been detected, especially for live births that resulted in an early death, in which case neither the birth nor the death may be registered. (Armenia only adopted the WHO definition of "live birth" in 2005.) No adjustments are made for missing or incomplete data on the official indicators that use vital registration.

- *Population data*. Population projections from the 2001 census are based on 2001 de jure population and do not take into account high levels of undocumented emigration. Hence the official population figures are overestimates. This results in an overestimated population projection based on the de jure population, which

affects the levels of mortality and morbidity indicators. For example, according to WHO estimates life expectancy at birth is actually lower in Armenia, likely by four to five years,[21] than the officially reported figures.

- *Cause of death*. Currently, only a short list of 229 causes are coded in death certifications (ICD-10 covers about 8000 causes of death, classified by 4-digit alphanumeric codes), which results in a loss of information and limits international comparability.

Summary of findings and policy recommendations

The success of a health system in improving population health is grounded in its success in achieving objectives which are instrumental to achieve better health outcomes. For example, limited access to and poor utilization of cancer screening tests result in low rates of early detection for cancers in their more treatable stages. That in turn leads to lower survival rates and increased morbidity due to malignant neoplasms, a key concern identified in this chapter. Consequently, many of the issues and situations that contribute to higher cancer morbidity and mortality concern issues are associated with the performance dimensions: behavioural risk factors, access to care, equity in financing, financial protection, etc. The policy recommendations associated with each performance dimension are meant to help achieve the instrumental goals and, ultimately, better health and more equitably distributed health for the Armenia population.

21 Life expectancy levels reported by the NSS are high compared to WHO estimates; on average, NSS estimates are 5–6% higher, or about four years longer average life expectancy at birth than WHO estimates. The difference may be due to underreporting of deaths in the vital registration system, and/or an overestimate of the official de jure population due to high levels of undocumented emigration.

Table 16. Findings and policy recommendations: health status

Situation	Policy recommendations
There is tentative evidence of improvements in health status over the past decade, as seen in declining childhood mortality rates and rather flat but possibly declining maternal mortality ratios. Overall, life expectancy has increased by 3.1 years compared to 1990. However, female life expectancy has exceeded that for males by five to six years over the past decade, with some indication that the gap is widening. It is not possible to analyse life expectancy and child and maternal mortality ratios by wealth quintile, or subnationally by marz. However, such detailed information is critical for a better understanding of the distribution of health status.	To the extent possible, analyse health status data by province (marz) and by socioeconomic and demographic background characteristics. For indicators based on routine data, such analysis may already be possible; for indicators based on survey information, it will be necessary to increase the sample size.
Overall, Armenians are perceiving themselves as healthier. While there is not any large difference in perceived health by location (urban or rural), other large differences exist: people in poorer quintiles report poorer health status than those in richer quintiles; likewise, people in older age groups report poorer health than those in younger groups. Males also report better health status than women.	Continue to track and report self-assessed health status by quintile, particularly during the economic downturn and co-payment policy changes. Consider tracking such information more frequently, and at the marz level.
Although men report being in better health than women, they have higher morbidity and die younger.	Devise men's health campaigns to increase their health awareness and motivate them to change habits.
Although child, infant and neonatal mortality rates have shown improvement, they are not on track to meet Armenian MDG targets. The maternal mortality ratio has improved somewhat, but the triennial average has recently increased in the past two years and remains well above the MDG target.	Focus on the policy recommendations designed to improve access to care and service quality for expectant mothers and children. Clarify Armenia's goals for these programmes and ensure not only that progress is monitored, but also that adjustments are made to stay on track to meet strategic targets.
Except for diabetes, mortality from noncommunicable diseases has been increasing. The prevalence of these diseases (particularly cardiovascular diseases and malignant neoplasms) is likely one of the factors limiting any improvement in life expectancy. The high rates for cardiovascular diseases are especially worrisome. Much of the burden of disease for noncommunicable diseases can be reduced through lifestyle changes, and it is important to make a concerted effort to promote such changes.	Conduct further studies to identify the factors responsible for the increase in morbidity for most major noncommunicable diseases (health care services utilization barriers? lifestyle behaviours?) – and for the decrease in morbidity for diabetes (better access to medications and services?). This information should be used to inform future interventions, which should focus particularly on people with low socioeconomic status.

Situation	Policy recommendations
Concerns have been raised about the data quality of key health indicators that are dependent on vital registration, such as life expectancy.	Conduct a full assessment of the vital registration system, including the quality of the databases of registered births and deaths. Determine if facilities have been consistently applying the proper definition of "live birth" since it was adopted in 2005; refresher training may be needed in some areas.

Annex A. The HSPA framework – performance dimensions, policy questions and performance indicators

Performance dimension	Policy questions	Performance indicators
Health system stewardship	Have policy instruments been mobilized to achieve health system objectives?	No quantitative indicators available, but a qualitative assessment was carried out.
	Is performance information used for decision-making in the Ministry of Health?	1. Monitoring and evaluation indicators that have been reported by government health programmes
	Is there evidence of intersectoral collaboration on policies that have an impact on health?	No quantitative indicators available, but a qualitative assessment was carried out.
Health management information system	Does the health management information system have the capacity to support the health system stewardship function of the Ministry of Health?	Country Health System Surveillance report used *(10)*
Development of health human resources	Is the health workforce sufficiently qualified, and its skill mix and geographical distribution adequate, to meet the health needs of the population?	2. Professional development of medical personnel 3. Availability and mix of health human resources
	Has retraining of the primary care workforce met the requirements established by primary care reform?	4. Mix of primary health care workforce 5. Progress on retraining of physicians and nurses for primary care reform
Equity in financing and financial protection	How have the level and share of the state budget allocated to health changed? How do they compare to corresponding measures for neighbouring countries?	6. Government health expenditures relative to GDP
	How have the relative importance of revenue collection mechanisms changed and what impact have these changes had on health care coverage, access to prepayment and financial protection?	7. Relative contribution of health system financing sources

Performance dimension	Policy questions	Performance indicators
Health system efficiency	Are health system resources being used productively to deliver better health outcomes to the people of Armenia?	8. Allocation of government health expenditures to primary care and hospital care 9. Structure of hospital and primary care spending on employee salaries, supplies, drugs and other expenses
	What progress has been made in implementing a health care system that is based on primary care?	10. Type of provider usually visited when sick or in need of advice about health 11. Patterns in hospital referrals for non-emergency conditions 12. Frequency of preventive visits by primary care providers
	What progress has been made in optimizing the hospital network in Yerevan and the marzes?	13. Total number of hospital facilities 14. Hospital beds per 10 000 population 15. Hospital beds compared to optimization targets 16. Utilization of hospital resources – bed occupancy rate and average length of stay
Access to health care services	Are health services accessible to everyone who needs them, especially the vulnerable?	17. Hospitalization rate per 100 population 18. Ambulatory care visits per capita 19. Number of people who do not seek medical care when needed
	Are pharmaceuticals becoming more accessible to those who need them through a combination of state investment in drug benefits and the capacity of the population to pay?	20. Private and government expenditures on medicines 21. Expenditures on medicines as a per cent of total health expenditures

Performance dimension	Policy questions	Performance indicators
Quality and safety of health care services	Are the health care services that the health system delivers to the people of Armenia safe and of acceptable quality, and do these services lead to acceptable health outcomes?	22. Detection rates and treatment effectiveness for malignant neoplasms 23. Treatment success rates for TB and the prevalence of multidrug-resistant TB 24. Hospital fatality rates
	Are the health care services that the health system provides to women and children safe and of acceptable quality, and do they lead to acceptable health outcomes?	25. Rates of selected natal and postnatal complications 26. Rate of caesarean sections 27. Screening rates for breast and cervical cancer 28. Coverage rate for early prenatal care 29. Per cent of infants under 6 months who are exclusively breastfed 30. Per cent of children receiving recommended immunizations
Risk factors, health promotion and disease prevention	What do the prevalence rates of biological and behavioural risk factors tell us about future health trends?	31. Prevalence of the following risk factors: a. overweight among adults (based on a body mass index greater than 25.0) b. daily tobacco use among males c. physical inactivity (less than 30 minutes per week of light physical activity) among adults d. high arterial blood pressure (>140/90 mmHg) among adults e. daily consumption among males of the equivalent of more than 20 mg of pure alcohol
	Are health education services successful in raising the awareness of the population?	32. Level of awareness of behavioural risk factors 33. Level of awareness of conditions (i.e. blood pressure, cholesterol levels and glucose levels) that would put individuals at risk for health problems, for example, diabetes or cardiovascular diseases 34. Level of awareness of communicable diseases (HIV and TB)
	Is there improvement in the environmental conditions that affect health status (water, sewage, waste and air quality)?	35. Source of drinking water 36. Perception of air quality

Performance dimension	Policy questions	Performance indicators
Health system responsiveness	Is the health system responsive to the needs and demands of the Armenian people?	37. Per cent of population rating positively each of the following domains of responsiveness: dignity, communication, confidentiality and autonomy
Improvement in health status	Are the level and distribution of health status among the population improving?	38. Life expectancy at birth 39. Self-assessed health status 40. Child, infant and neonatal mortality rates 41. Maternal mortality ratio
	What are the main patterns of disease incidence and prevalence?	42. Mortality rates by main cause of death 43. Morbidity rates by main cause

Table B1. Availability of monitoring and evaluation indicators for public programmes and strategies with a health care component, active and under development

Ministry of Health: health care programmes and strategies		Timeframe for implementation	Availability of monitoring indicators	Availability of monitoring target values	Availability of annual reports
Armenian socioeconomic development programmes					
1.	Armenian Government Programme	2008–2015	Yes	Yes	Yes
2.	Armenian Sustainable Development Programme (PRSP-2)	2008–2021	Yes	No	Yes
3.	Armenian Public Medium-Term Expenditure Framework	2009–2011	Yes	No	Yes
Health care programmes					
4.	Armenian Primary Health Care Strategy	2008–2013	Yes	No	Yes
5.	Armenian Strategy for Improvement of Maternal and Child Health Care	2003–2015	Yes	Yes	Yes
6.	Armenian National Programme for Improvement of Reproductive Health	2007–2015	Yes	—	Yes
7.	National Programme of Early Detection, Treatment and Prevention of Cervical Cancer in Armenia	2006–2015	Yes	Yes	Yes
8.	Armenian National Programme of Health System Optimization in Marzes	2006–2012	Yes	No	Yes
9.	Armenian National Programme of Immunization	2006–2010	Yes	No	Yes
10.	Armenian National TB Control Programme	2007–2015	Yes	No	Yes
11.	National Programme on the Response to HIV Epidemic in the Republic of Armenia	2007–2011	Yes	Yes	Yes

Ministry of Health: health care programmes and strategies		Timeframe for implementation	Availability of monitoring indicators	Availability of monitoring target values	Availability of annual reports
12.	Armenian National Programme of Tobacco Control	2005–2009	Yes	No	Yes
13.	Armenian National Targeted Programme on Eradication of Local Malaria	2006–2010	Yes	No	Yes
14.	Armenian National Action Plan on Environmental Hygiene	2002–2015	Yes	No	Yes
15.	Armenian National Strategic Programme for Prevention of Blindness	2007–2010	Yes	Yes	Yes
16.	Armenian National Programme for Improvement of Adolescent Health	2009–2015	In development	—	—
17.	Armenian Concept Paper on Prevention, Early Detection and Treatment of Most Prevalent Non-Communicable Diseases	—	In development	—	—

Table B2. Millennium Development Goal (MDG) targets for Armenia

MDG indicators	Value in 1990	Target for 2015
Reduce by 2015 the child mortality for the 0–5 age group by two thirds of what it was in 1990	24	8
Infant mortality (age 0–1) per 1000 live births	19	6.3
Immunization coverage (%)	95.2%	>96%
Reduce by 2015 the maternal mortality ratio by three fourths of what it was in 1990	38.5	9.6

Table B3. Target values for the 2006–2015 National Programme for Early Detection, Treatment and Prevention of Cervical Cancer in Armenia

Indicators	Value in 2005	Target for 2010	Target for 2015
Morbidity rate (per 100 000)	13.8	9.7 (30% reduction)	6.9 (50% reduction)
Mortality rate (per 100 000)	8.6	6.5 (25% reduction)	4.3 (50% reduction)
Percentage of advanced (neglected) cases	47%	23.5% (50% reduction)	14.1% (70% reduction)
Coverage of women recommended for screening (Pap smear)	—	50%	80%

Table B4. Capacity and utilization of hospital resources by marz, 2006–2008

Marz	Absolute number of beds			Beds per 10 000 population			Annual bed occupancy rate		
	2006	2007	2008	2006	2007	2008	2006	2007	2008
Aragatsotn	468	438	258	33.4	31.2	18.3	59	66	124
Ararat	805	805	693	29.3	29.1	25.0	135	138	172
Armavir	632	362	345	22.6	12.9	12.2	100	172	171
Geghark'unik'	889	807	807	37.1	33.6	33.5	240	264	274
Kotayk'	935	785	669	33.9	28.3	24.0	144	199	232
Lorri	840	600	555	29.7	21.3	19.7	116	163	186
Shirak	1 034	894	874	36.8	31.8	31.1	166	191	196
Syunik'	710	545	435	46.4	35.7	28.4	114	160	210
Tavush	380	370	275	28.3	27.6	20.5	104	107	140
Vayots' Dzor	190	180	95	34.1	32.3	17.0	70	80	147
Total	6 883	5 786	5 006	ND	ND	ND	ND	ND	ND

ND: not determined.

Table B5. Armenian population, GDP, government budget and structure of expenditures on health, 2001–2008

	2001	2002	2003	2004	2005	2006	2007	2008
Armenian population (thousands)	3 213.0	3 212.9	3 210.3	3 212.2	3 215.8	3 219.2	3 022.9	3 234.0
GDP (AMD billions)	1 175.9	1 362.5	1 624.6	1 907.9	2 242.9	2 657.1	3 139.4	3 520.0
GDP growth vs previous year[22]	—	+15.9%	+19.2%	+17.4%	+17.6%	+18.5%	+18.2%	+12.1%
Government expenditures (AMD billions)	278.1	299.8	364.6	393.5	488.5	527.2	565.9	810.6
Government expenditure growth vs previous year[23]	—	+7.8%	+21.6%	+7.9%	+24.1%	+7.9%	+7.3%	+43.2%
Government health expenditures (AMD billions)	18.7	18.5	24.6	32.7	39.8	51.2	65.9	54.5
Government health expenditure growth vs previous year[24]	—	–1.1%	+33.0%	+32.9%	+21.7%	+28.6%	+28.7%	–19.0%
Government health expenditures per capita (AMD)	5 820	5 758	7 663	10 180	12 376	15 905	21 800	16 512
Government expenditures as % of GDP	23.6%	22.0%	22.4%	20.6%	21.8%	19.8%	18.0%	23.0%
Government health expenditures as % of GDP	1.6%	1.4%	1.5%	1.7%	1.8%	1.9%	2.1%	1.5%
Government health expenditures as % of total government expenditures	6.7%	6.2%	6.7%	8.3%	8.1%	9.7%	11.6%	6.6%

22 Average annual GDP growth in 2002–2008 was 17.2%.

23 Average annual government expenditure growth in 2002–2008 was 18.7%.

24 Average annual health expenditure growth in 2002–2007 was 29.0%.

	2001	2002	2003	2004	2005	2006	2007	2008
Structure of health expenditures (AMD billions)								
Government expenditures as per cent of total	23.7%	24.3%	26.2%	30.0%	32.8%	41.2%	47.3%	38.9%
Household/private as per cent of total	61.7%	66.6%	66.5%	68.7%	59.9%	51.5%	48.2%	50.8%
NGO expenditures as per cent of total	14.6%	8.9%	7.2%	1.1%	7.2%	7.2%	4.4%	10.1%
Insurance as per cent of total	0.0%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	0.2%
Total health expenditures in Armenia, %	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Government health expenditures by type (AMD billions)								
Hospital sector	8.9	9.1	10.5	13.0	14.2	14.7	16.1	19.1
Primary health care settings	3.0	3.4	6.5	8.0	12.1	13.9	16.9	19.1
Expenditures for medicines (AMD millions)								
Government expenditures for medicines	—	—	—	2 394	2 773	2 580	3 293	4 118
Private expenditures for medicines	—	—	—	17 427	15 063	17 463	20 521	18 986

GDP: gross domestic product, NGO: nongovernmental organization.
Source: NHA.

Table B6. Government health expenditures by area as per cent of total, 1998–2008

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Public administration in health sector	0.2%	0.5%	0.6%	0.5%	0.5%	1.1%	2.0%	1.6%	1.9%	1.9%	1.7%
Hospital health care	45.6%	47.7%	13.9%	61.2%	55.3%	55.3%	51.7%	43.5%	37.0%	38.1%	36.6%
Primary health care	25.1%	26.4%	75.8%	24.3%	23.2%	33.4%	34.8%	38.7%	36.4%	37.8%	38.6%
Hygienic and epidemiological services	4.6%	4.7%	1.5%	5.4%	5.3%	2.8%	4.0%	4.5%	5.0%	6.6%	5.4%
Other medical services	6.7%	5.0%	3.5%	8.6%	15.7%	7.4%	7.5%	11.7%	16.2%	12.2%	14.0%
Auxiliary health services and programmes	17.9%	15.7%	4.7%	0.0%	0.0%	0.0%	0.0%	0.0%	3.6%	3.4%	3.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table B7. Government health expenditures by area, 1998–2008, AMD billions

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Public administration in health sector	40.2	109.8	387.1	81.1	77.3	233.2	502.5	510.7	730.5	844.1	867.6
Hospital health care	8 042.0	9 799.6	8 905.8	9 843.3	8 896.8	11 625.4	12 921.8	13 994.3	14 611.1	16 848.9	18 451.4
Primary health care	4 426.0	5 426.4	4 850.0	3 916.2	3 735.8	7 021.3	8 716.5	12 442.5	14 344.6	16 726.3	19 445.4
Hygienic and epidemiological services	806.3	964.0	952.9	866.4	849.6	584.6	1 000.0	1 440.0	1 959.6	2 922.0	2 732.7
Other medical services	1 179.8	1 016.9	2 209.0	1 376.6	2 531.3	1 549.4	1 870.3	3 774.4	6 387.0	5 391.9	7 053.2
Auxiliary health services and programmes	3 156.3	3 213.8	3 006.6	0.0	0.0	0.0	0.0	0.0	1 402.3	1 521.5	1 821.9

Table B8. Relative percentage change from 2006 to 2008 in hospital efficiency and utilization indicators, by marz

Marz	Relative change, 2006–2008			
	In number of hospital beds	In hospitalization rate	In annual bed occupancy rate	In average length of stay
Aragatsotn	–45.2%	+16.7%	+110%	0.0%
Ararat	–14.7%	+11.9%	+27%	–3.2%
Armavir	–46.0%	–5.6%	+71%	–3.2%
Geghark'unik'	–9.7%	+15.0%	+14%	–9.0%
Kotayk'	–29.2%	+13.6%	+61%	0.0%
Lorri	–33.7%	+10.2%	+60%	–4.2%
Shirak	–15.5%	+7.7%	+18%	–5.4%
Syunik'	–38.8%	+8.0%	+84%	+3.7%
Tavush	–27.6%	–2.2%	+35%	0.0%
Vayots' Dzor	–50.1%	+7.3%	+110%	–1.7%

Source: NHIAC.

Table B9. Numbers of active primary care doctors and nurses by specialty, 2002–2008

	2002	2003	2004	2005	2006	2007	2008
Doctors	4 409	4 548	4 583	4 640	4 628	4 650	4 859
"Narrow" specialists	2 486	2 649	2 679	2 746	2 744	2 777	3 023
General practitioners	1 923	1 899	1 904	1 894	1 884	1 873	1 836
District physicians	973	956	938	917	915	872	821
District paediatricians	872	850	824	813	780	700	651
Family doctors	50	69	115	127	165	282	354
Nurses	5 914	5 729	5 667	5 889	5 958	5 988	6 122
Midwives	595	566	531	535	544	547	552
Family doctors as percentage of all general practitioners	2.6%	3.6%	6.0%	6.7%	8.8%	15.1%	19.3%

Source: NHIAC.

Table B10. List of population groups eligible for state basic benefit package

1.	I group disability (most severe)
2.	II group disability
3.	III group disability (least severe)
4.	World War II veterans
5.	Single-parented children younger than 18
6.	Orphans younger than 18
7.	Disabled children younger than 18
8.	Children of families with 4 or more children younger than 18
9.	Family members of those who served in the military and who died in Armenia defence or while carrying out professional duties
10.	Persons who participated in clean-up of Chernobyl accident
11.	Exiles
12.	People referred for additional examinations under SMEC
13.	Children who have disabled parents and are younger than 18
14.	Children under 7 years old
15.	People of pre-conscript and conscript age
16.	Military employees and their family members
17.	People in detention
18.	People receiving poverty family benefit
19.	People in orphanages or retirement homes
20.	Children under 8 and also 12 years old, 65 and over population – specialized dental care
21.	People referred by the Ministry of Health, provincial governments or medical facilities
22.	Women in fertility age (in pregnancy, delivery and postnatal period) in order to the Ministry of Health of Armenia
23.	Victims of trafficking
24.	Persons referred by RoA MOH, regional governments and medical facilities

Table B11. Household spending on health care services as a per cent of income, by income quintile, 2006

Type of service	quintile I (poorest)	quintile II	quintile III	quintile IV	quintile V (richest)	Average
Ambulatory/polyclinic services	0.7%	0.5%	0.3%	0.2%	0.2%	0.4%
Emergency care	0.2%	0.1%	0.07%	0.06%	0.03%	0.1%
Dentistry	0.9%	0.5%	0.5%	0.6%	0.2%	0.5%
Hospital care	14.7%	3.7%	5%	5.6%	2%	6.2%
Obstetrics and gynaecology	1.3%	0.5%	0.8%	0.4%	0.2%	0.6%
Rehabilitation and sanatorium care	0.4%	0.07%	0.08%	0.2%	0.2%	0.1%
Traditional and other health care	0.2%	0.02%	0.1%	0.2%	0.03%	0.1%
Laboratory and instrumental diagnosis	1.5%	0.6%	0.7%	0.6%	0.5%	0.8%
Drugs, food supplements and medical supplies	6.2%	2.9%	3.2%	2.6%	1.6%	3.3%
Total	26.2%	8.8%	10.8%	10.6%	5.2%	12.3%

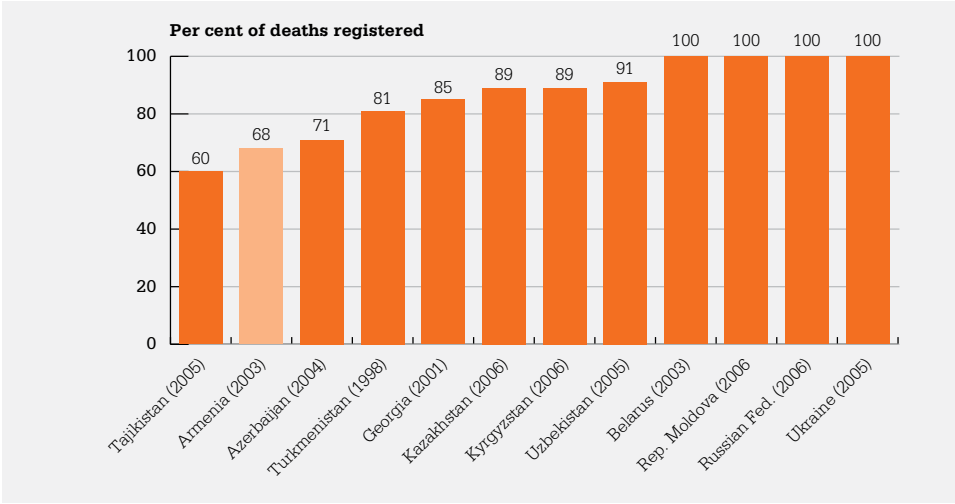
Source: Feeley F et al., 2008 (20)

Annex C. Data quality assessment of selected HSPA indicators[25]

Quality of vital registration data, 12 CIS countries

WHO estimates that the vital registration system in Armenia (latest estimate, 2003) captures 68% of adult deaths and 62% of all deaths (Figs C1 and C2). This incompleteness in reporting, together with population estimates based on de jure rather than de facto residency, is likely to result in over- or underestimates for indicators that are calculated based on mortality data, including life expectancy at birth, childhood mortality, maternal mortality ratio and the main causes of mortality.

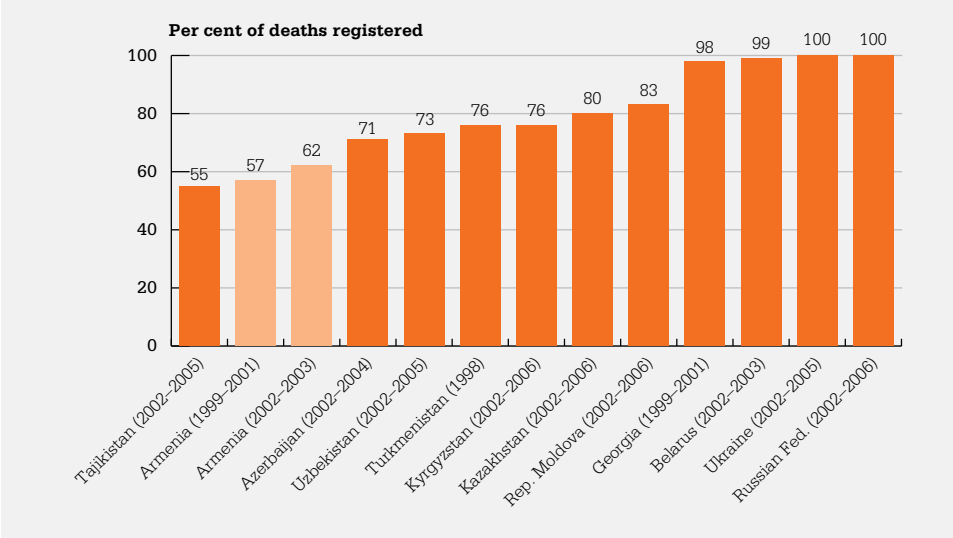
Fig. C1. Completeness of mortality data in CIS countries, most recent estimate



Note: For completeness < 100%, the figures refer to completeness of adult deaths. Completeness of child deaths is likely to be lower.
Source: WHO Statistical Information System (WHOSIS) (http://apps.who.int/whosis/database/mort/table3.cfm).

25 From *Country Health Systems Surveillance (CHeSS) situation analysis for the republic of Armenia (10).*

Fig. C2. Coverage of mortality data in CIS countries, most recent estimate



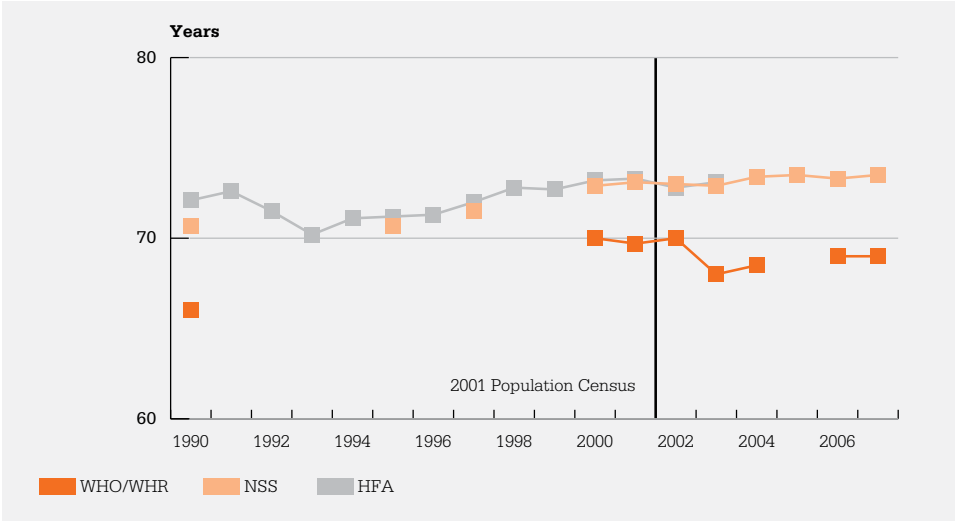
Note: Coverage is calculated by dividing the total deaths reported from the vital registration system by the total deaths estimated by WHO for the same year.
Source: WHO Statistical Information System (WHOSIS) (http://apps.who.int/whosis/database/mort/table4.cfm).

HSPA indicators based on vital registration and routinely reported data

A. Life expectancy at birth

Life expectancy levels reported by the NSS (and the HFA-DB) are high compared to WHO estimates; on average, NSS estimates are 5–6% higher, or about four years longer at birth than WHO estimates (Fig. C3). The difference may be due to underreporting of deaths in the vital registration system and/or overestimating the population due to high levels of undocumented emigration. Note that the irregular drop in life expectancy, as estimated by WHO sources, may be due in part to an adjustment following the results of the 2001 Armenia Population Census.

Fig. C3. Armenian life expectancy at birth, various estimates, 1990–2007



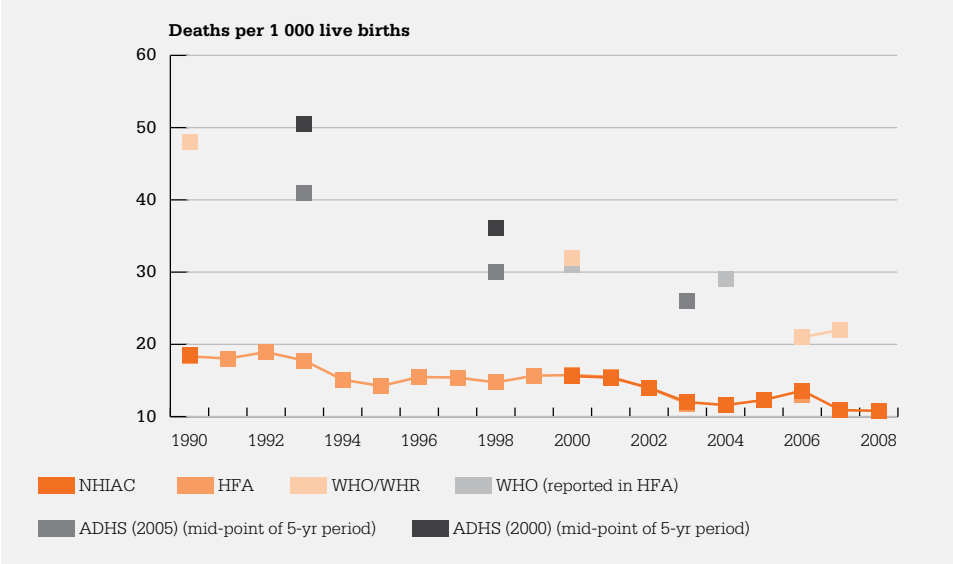
HFA: European Health for All Database; NSS: National Statistics Service; WHR: World Health Report.
Sources: NSS; HFA-DB; WHOSIS; WHR 2009 *(32)*.

Childhood mortality indicators

B. Infant mortality rate

Infant mortality levels reported by the NHIAC (and the European Health for All Database) are consistently low compared to WHO estimates and population-based survey estimates, although the trends have begun to converge in recent years (Fig. C4). It should be noted that early neonatal mortality data are collected by NHIAC (using Facility Reporting Forms N32 and N2), while neonatal mortality is collected by the NSS (using vital registration data from the Civilian Registry Offices). Early deaths (0–6 days) in particular may go unregistered by the Civilian Registry Offices – especially if the birth was not registered – and account for a measure of underreporting. The WHO definition of live birth was adopted in 2005 and may not have been initially applied with consistency. It is worth noting that there have been incentives to ensure reporting of all births and early deaths. The ADHS survey point estimates of infant mortality in 2000 and 2005 have their unique data quality issues, notably the poor recall of early deaths associated with estimates that go further back in time; these estimates also have fairly large 95% confidence intervals due to the relative rarity of the event.

Fig. C4. Infant mortality estimates for Armenia, 1990–2008

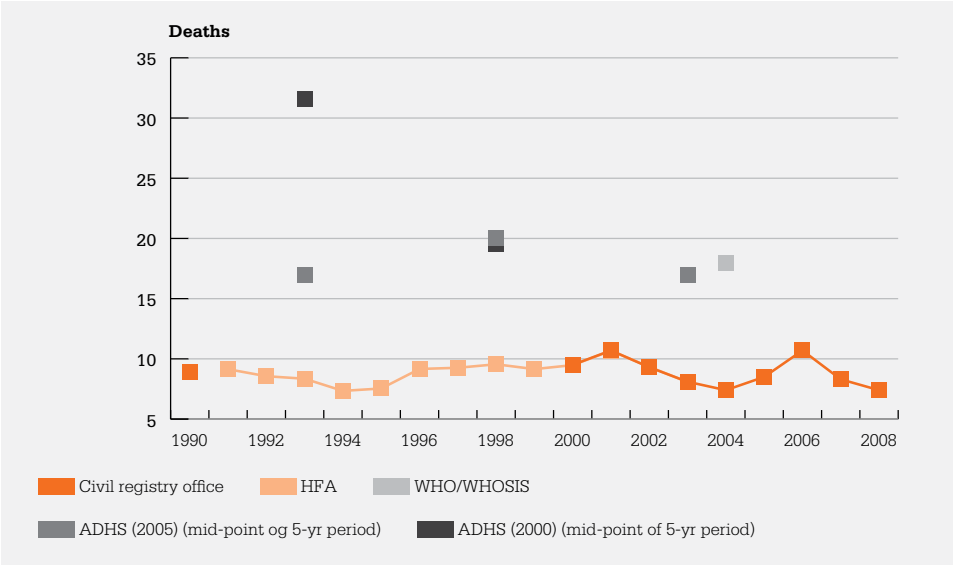


ADHS: Armenia Demographic and Health Survey, HFA: European Health for All Database, NHIAC: National Health Information Analytical Centre, WHR: World Health Report.
Sources: NHIAC; HFA-DB; WHOSIS; WHR; ADHS, 2000, 2005.

C. Neonatal mortality rate

The HSPA indicator is early neonatal mortality rates (within six days of birth), but since this indicator is not regularly reported by other sources, neonatal mortality rates (NNM) were assessed instead. The neonatal mortality rate is subject to data quality issues similar to what the infant mortality rate is (see above), particularly the probable underreporting of deaths – especially early neonatal deaths – and the population overestimate, leading to probable underestimation of the true rate (Fig. C5). It should be noted that, as a summary data quality check, the ADHS surveys examined the ratio of neonatal to infant mortality and concluded that the ratio was sufficiently high (above 0.50 for the three 5-year periods prior to the survey) to rule out significant underreporting of neonatal deaths in the ADHS surveys.

Fig. C5. Neonatal mortality estimates for Armenia, 1990–2008

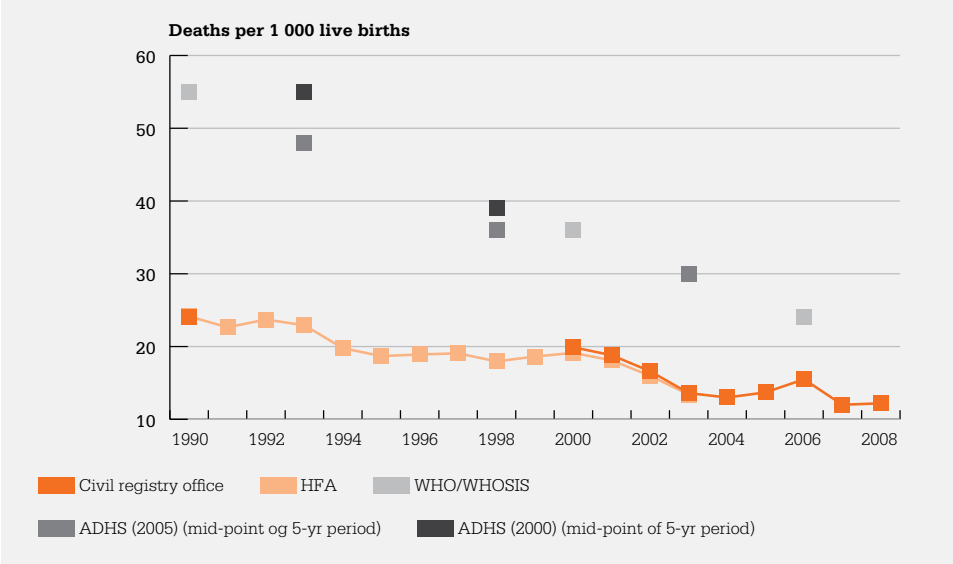


Sources: NHIAC; HFA-DB; WHOSIS; ADHS, 2000, 2005.

D. Under-5 mortality

The data quality issues for under-5 mortality (Fig. C6) are similar to those for infant mortality and neonatal mortality (see above).

Fig. C6. Under-5 mortality estimates for Armenia, 1990–2008

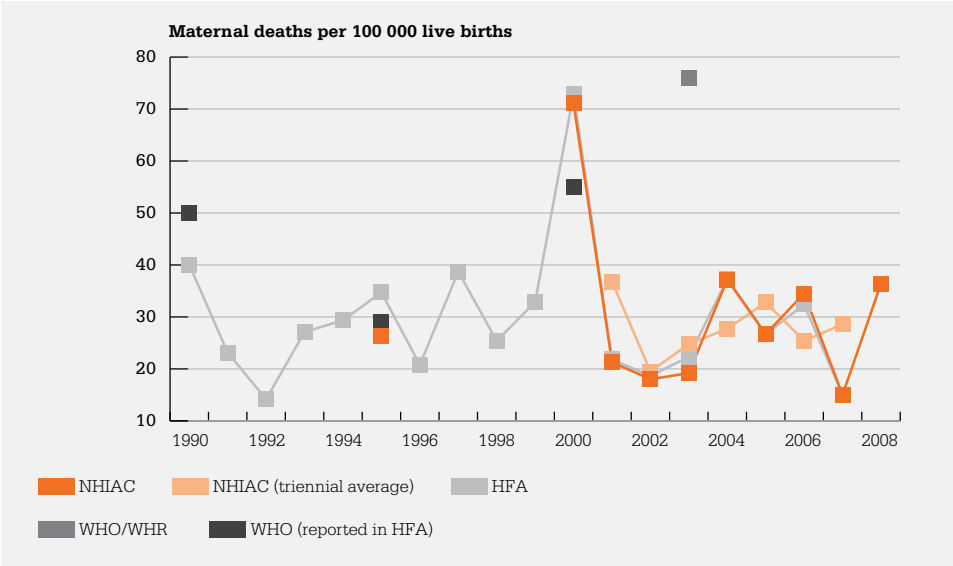


Sources: NHIAC; HFA-DB; WHOSIS; ADHS, 2000, 2005.

E. Maternal mortality ratio

In general there is good correspondence between the maternal mortality ratio estimates from the NHIAC and the HFA-DB (which includes WHO estimates) (Fig. C7). Each year, a cross-check is conducted for every maternal death reported by the vital registration system or health care facilities. However, the WHO Maternal Mortality Working Group responsible for preparing national estimates has stated that for Armenia, "no appropriate maternal mortality data were available 1995–2005" *(33)*. Therefore, the Working Group derived an estimate for Armenia in 2003 from a model that included the following covariates: PMDF (Proportion Maternal among Deaths of Females of reproductive age), GDP (Gross Domestic Product), GFR (General Fertility Rate), SKA (proportion of births with SKilled Attendants) and VRcomplete. Note that the WHO/WHR uses this model estimate of 76 maternal deaths per 100 000 live births. It is worth noting that the NHIAC triennial average for 2003 falls just within the lower 95% confidence interval of the Working Group estimate for 2003. (the confidence interval, which Fig. C7 does not show, is 23–250 deaths per 100 000).

Fig. C7. Estimates of the maternal mortality ratio for Armenia, 1990–2008

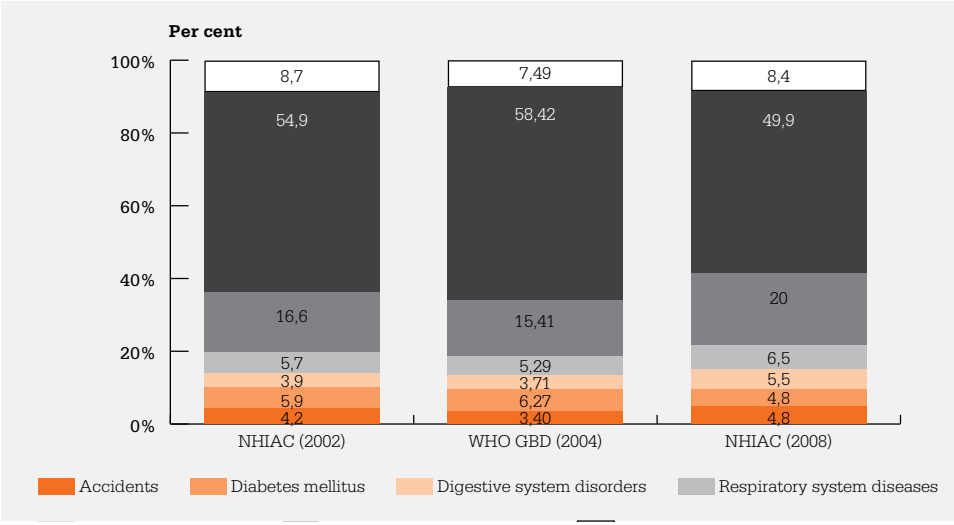


Sources: NHIAC and the Strategy for the Improvement of Maternal and Child Health Care (1995 and 2000-2008 estimates only); HFA-DB; WHOSIS; WHR 2009.

F. Proportional distribution of the major causes of death

The percentage distribution of the main causes of death in 2002 and 2008, as reported by the NHIAC, compares well with the distribution given for Armenia by the WHO Global Burden of Disease for 2004 (Fig. C8).

Fig. C8. Major causes of death as percentages of total deaths, 2002, 2004 and 2008

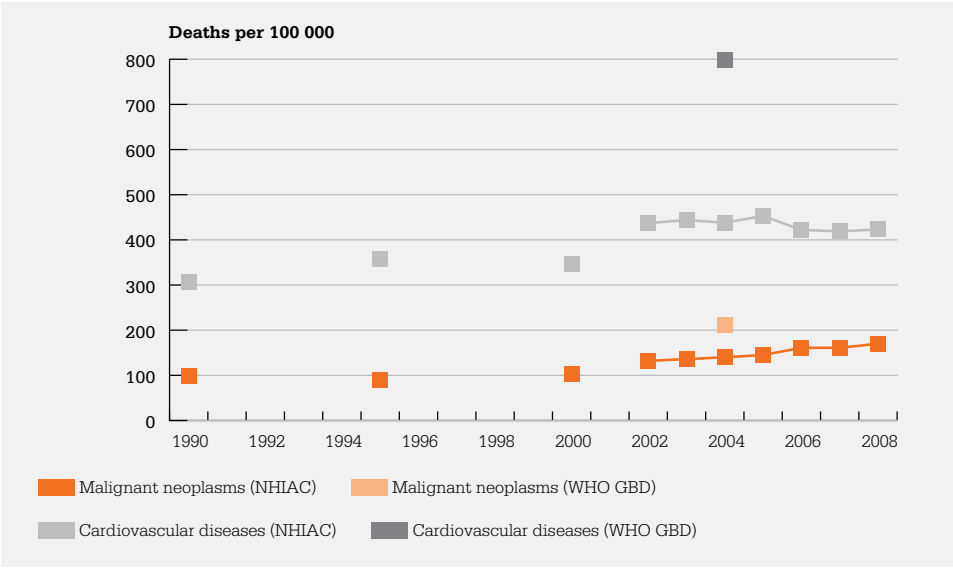


Sources: NHIAC, WHO Global Burden of Disease 2004.

G. Mortality rates for the major causes of death

Of the six major causes of death in Armenia, the two largest causes were assessed for data quality – circulatory system diseases and malignant neoplasms. Mortality levels estimated by the NHIAC for these two causes are lower than those estimated by the WHO's Global Burden of Disease for 2004 (Fig. C9). The trends estimated by the NHIAC show an increase in the rates for malignant neoplasms. Estimates for both diseases appear to have been recalibrated after the 2001 Armenia Population Census. (Note that the HFA-DB provides age-standardized estimates only, which are not directly comparable to these direct estimates.)

Fig. C9. Mortality rates for the two greatest causes of death in Armenia, 1990–2008



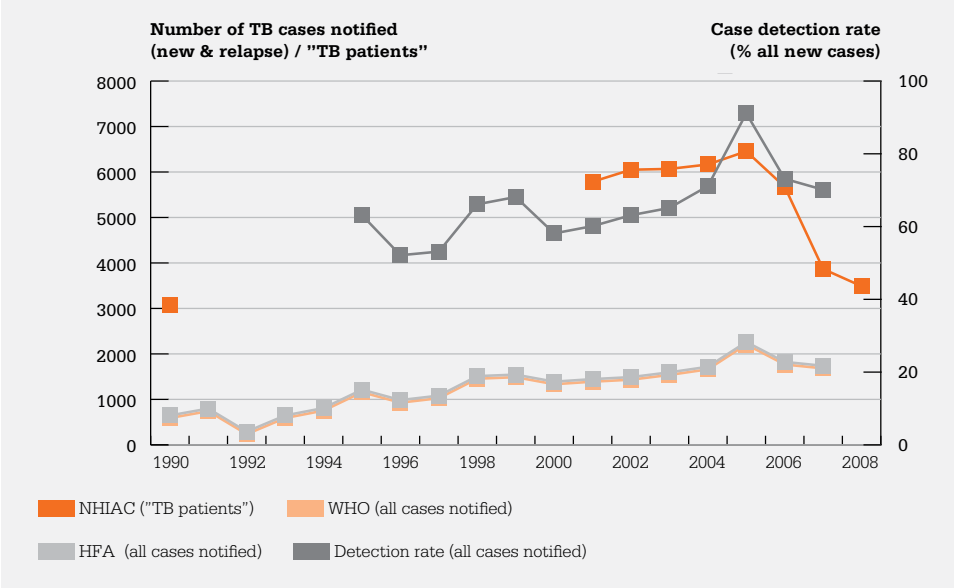
Sources: NHIAC, WHO Global Burden of Disease 2004.

TB indicators

H. TB morbidity and TB notifications

Estimates from the two WHO databases (HFA-DB and the Global TB Database) match exactly for all forms of TB reported in Armenia, whereas the numbers reported by the NSS/NHIAC are much higher (Fig. C10). The difference may be definitional – the NSS and NHIAC report "TB patients", which is not a standard definition, while "TB morbidity" includes the number of cases (all forms) notified. All the sources show a rising trend from 2001 to 2005, followed by a decrease, though the decrease is notably sharper according to the NSS/NHIAC. Indeed, the estimated case detection efforts indicate a rapid expansion or intensification of efforts, reaching a 92% detection rate, followed by a sharp decline to only 70%. Further explanation of the fluctuations from 2004 to 2008 is needed.

Fig. C10. Tuberculosis morbidity estimates for Armenia, 1990–2008

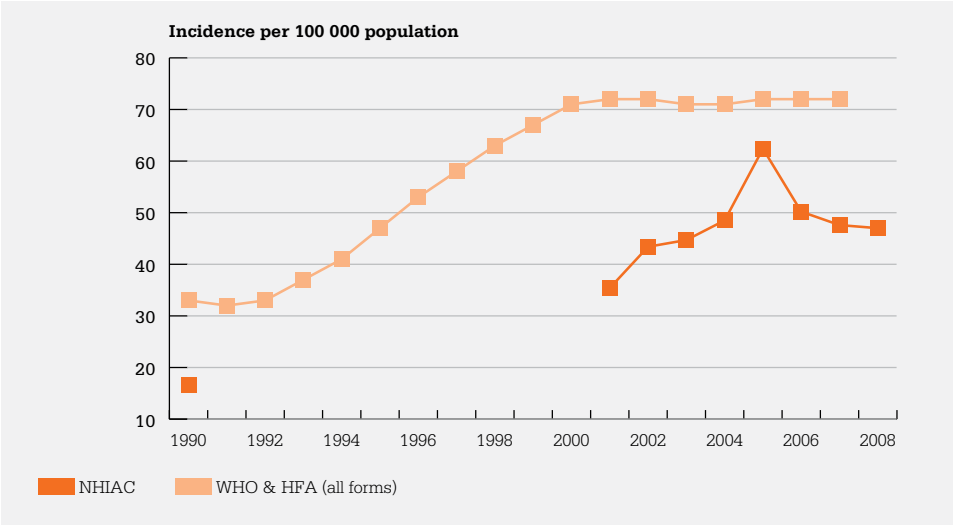


Sources: NHIAC, NSS; National TB Programme; HFA-DB; WHO Global TB Database.

I. TB incidence rates

The WHO and HFA-DB incidence rates are higher than the directly reported rates from the NHIAC (Fig. C11). That is because WHO engages in a consultative process to incorporate new information on estimates in order to arrive at the "truest" incidence rate. Normally, TB is a stable disease, and spikes in the trend, such as seen in Armenia in 2005, are highly irregular. The NHIAC disease incidence in 2005 probably reflects the increased case detection effort in that year. Note that at the height of case detection efforts (92%), NHIAC's reported incidence was almost the same as the "true" incidence from WHO. Detailed information on WHO adjustment procedures for Armenia has been shared with the Armenia National TB Programme.

Fig. C11. Tuberculosis incidence estimates for Armenia, 1990–2008

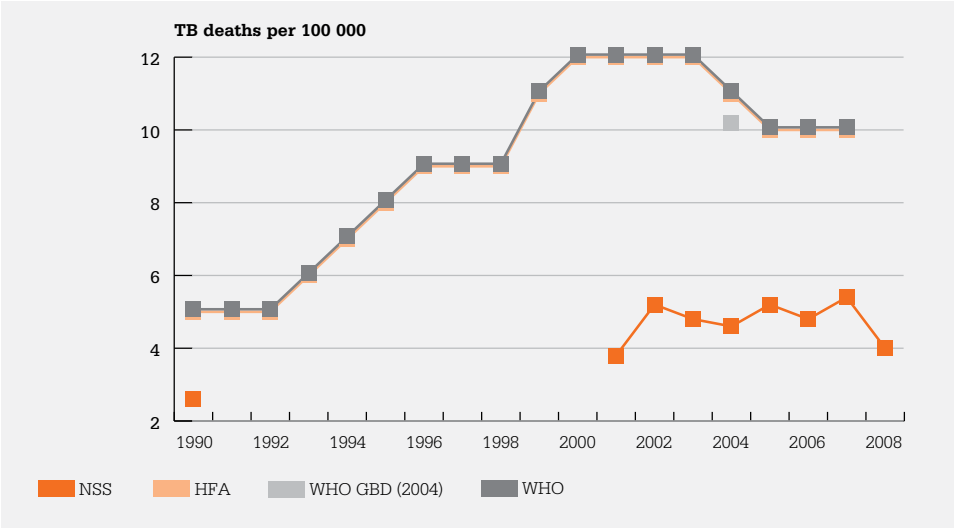


Sources: NHIAC/NSS; National TB Programme; HFA-DB; WHO Global TB Database.

J. TB-attributed mortality

The TB-attributed mortality estimated by the NSS/NHIAC is significantly lower than the Global TB Database and HFA-DB estimates, and does not suggest a reduction in mortality rates after 2003 (Fig. C12). As with earlier mortality-related indicators, this relatively low level is at least in part related to underreporting in the vital registration system.

Fig. C12. Estimated mortality attributed to TB, 1990–2008

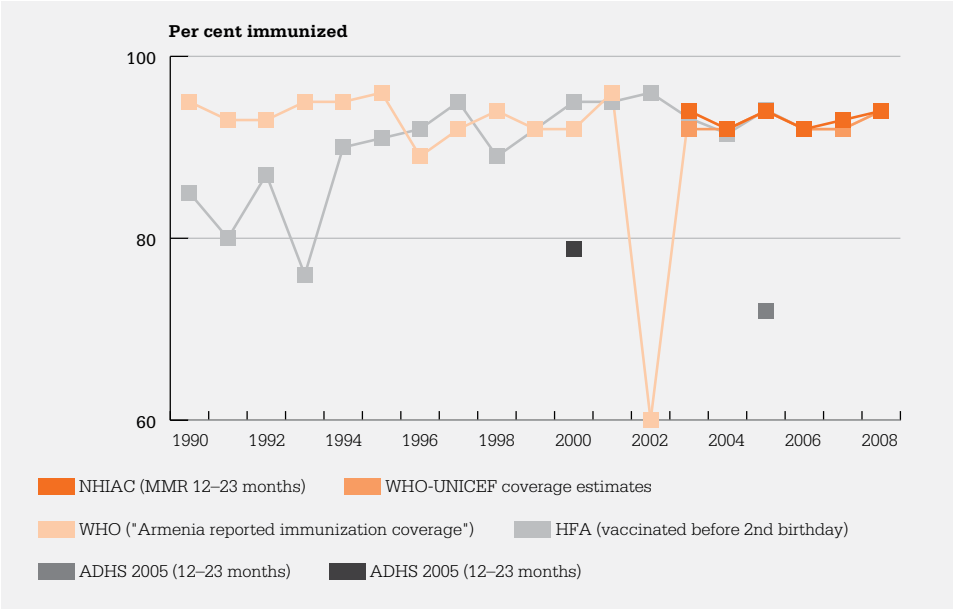


Sources: NHIAC/NSS, National TB Programme, HFA-DB; WHO Global TB Database; WHO Global Burden of Disease 2004.

K. Immunization coverage of DPT3

The official coverage estimates reported by NHIAC, the WHO immunization surveillance database and HFA-DB for immunizing children age 12–23 months against measles, compare well with each other between 2003 and 2008 (Fig. C13). There is no readily apparent trend in improving or worsening coverage. The WHO-UNICEF coverage reported in 2002, however, is an outlier and should be investigated. Notably, the ADHS 2000 and 2005 survey point estimates, for the same indicator, shows significantly lower estimates, 10–20 percentage points below the official estimates. Attention needs to be paid to reconciling these indicators from various sources, and the 2010 ADHS will provide updated information for making possible adjustments.

Fig. C13. Immunization coverage estimates for DPT3 in Armenia, 1991–2008



Sources: NHIAC; HFA-DB; ADHS, 2000, 2005; WHO immunization surveillance database (http://www.who.int/immunization_monitoring/en/globalsummary/timeseries/tscoveragebycountry.cfm?C=ARM).

HSPA indicators

The purpose of documenting HSPA results compared to other sources is to highlight differences in measurement or in samples. In many cases, survey methodologies could be harmonized to obtain better trend information.

L. Self-assessment of health status

- The 2005 ADHS asked a similar question: "Are you satisfied with your health?" The responses, which ranged from "very satisfied" to "very dissatisfied", were not analysed in the final ADHS report.

M. Behavioural and biological risk factors

Tobacco. The HSPA survey estimates for tobacco use appear reasonable compared to ADHS and other estimates (Table C1), although they are not strictly comparable due to differences in the age groups.

Table C1. Percentage of males age 20 and older who use tobacco

Tobacco use (age 20+, male)			Related estimates on tobacco use (not strictly comparable with HSPA)			
	HSPA 2007	HSPA 2009	HFA-DB[a]	WHO/WHR[b]	ADHS 2005[c]	ADHS 2000[c]
1998	—	—	29.0%	—	—	—
1999	—	—	—	—	—	—
2000	—	—	—	—	60.5%	67.5%
2001	—	—	35.3%	—	—	—
2002	—	—	—	—	—	—
2003	—	—	—	—	—	—
2004	—	—	—	—	—	—
2005	—	—	28.4%	29.6%	—	—
2006	—	—	27.3%	—	—	—
2007	55.7%	—	27.0%	—	—	—
2008	—	—	—	—	—	—
2009	—	58.0%	—	—	—	—

a age 15 and older only, **b** age-standardized, **c** age 15–49.
ADHS: Armenia Demographic and Health Survey, HFA-DB: European Health for All Database, HSPA: health system performance assessment; WHR: World Health Report.

High blood pressure. The HSPA survey estimates for systolic arterial blood pressure appear low, especially considering the age group is 20 and older, with no upper age limit (Table C2).

Table C2. Percentage of adults age 20 and older with high blood pressure

	HSPA 2007	HSPA 2009	ADHS 2005[a]
2005	—	—	21.0% women 27.3% men
2006	—	—	—
2007	13.4	—	—
2008	—	—	—
2009	—	11.9	—

a age 15–49, no combined estimate for "both" sexes
ADHS: Armenia Demographic and Health Survey, HSPA: health system performance assessment.
Note. High blood pressure is defined as having a systolic arterial blood pressure greater than 140 mmHg.

Alcohol. There are no strictly comparable data on alcohol consumption, as measurement approaches vary, as does the age and sex of the sample populations (Table C3). Concerning HSPA survey questions alcohol, they seem complex to respond accurately; maybe use other questions, such as those in the 2005 Republic of Moldova Demographic and Health Survey.

Table C3. Percentage of males 20 and older who consume the equivalent of 20 g alcohol per day

	HSPA 2007	HSPA 2009	HFA-DB[a]	WHO/WHR[b]
1992	—	—	1.70	—
1993	—	—	1.78	—
1994	—	—	2.80	—
1995	—	—	1.90	—
1996	—	—	1.85	—
1997	—	—	1.41	—
1998	—	—	1.30	—
1999	—	—	1.39	—
2000	—	—	1.27	—
2001	—	—	1.04	1
2002	—	—	0.93	—
2003	—	—	1.05	1.48
2004	—	—	—	—
2005	—	—	—	—
2006	—	—	—	—
2007	11.4%	—	—	—
2008	—	—	—	—
2009	—	16.6%	—	—

a Litres of alcohol consumed, age 15 and older, both sexes.
b Litres of alcohol consumed, adults.
HFA-DB: European Health for All Database, HSPA: health system performance assessment; WHR: World Health Report.

Overweight and inactivity. There are no strictly comparable data for these indicators that will enable comparison of estimates from different sources. In general, for body mass index, the HSPA measures higher percentages of overweight than the ADHS survey estimates, but the HSPA sample is also limited to a slightly older age group, 20 and older.

Table C4. Percentage of people 20 and older with a body mass index of more than 25

	HSPA 2007	HSPA 2009[a]	ADHS 2005[b]	ADHS 2000[b]	WHO/WHR[c]
2000	—	—	—	41.5%	—
2001	—	—	—	—	—
2002	—	—	—	—	—
2003	—	—	—	—	—
2004	—	—	—	—	—
2005	—	—	32.4%	—	15.5%
2006	—	—	—	—	—
2007	52.8%	—	—	—	—
2008	—	—	—	—	—
2009	—	53.6%	—	—	—

a Female estimate is 45.8
b Women only, age 15–49
c BMI>30
ADHS: Armenia Demographic and Health Survey, HSPA: health system performance assessment, WHR: World Health Report.

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