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Economic Impact of Noncommunicable Diseases in Azerbaijan

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Written by:

Teymur Asadov, MD, MSc, consultant
Fuad Ibrahimov, MD, MPH, consultant
Tohfa Jamilova, MD, PHRC

Table of Contents

1 Introduction

Available data demonstrate high mortality and morbidity rates due to noncommunicable disease in Azerbaijan. In 2008, chronic diseases accounted for 87% of all deaths in the country. The main cause of mortality was cardiovascular disease followed by cancer, chronic respiratory disease and diabetes (Azerbaijan State Statistical Committee). Many cases of noncommunicable diseases are attributable to high prevalence of four preventable risk factors: tobacco smoking, physical inactivity, alcohol misuse and unhealthy diet.

The impact of chronic diseases on national budgets, households and economic growth is substantial. In addition to direct treatment costs chronic diseases contribute to lost productivity through work absenteeism and early retirement. The economic effect of seven chronic conditions in the United States was estimated to be USD 277 billion in treatment costs and over a trillion USD as a result of lost productivity in 2003 (An Unhealthy America: The Economic Burden of Chronic Disease). Treatment costs of diseases of circulatory system in Russia were estimated to account for 20.8% of total health expenditure in 2003 (USD 2.7 billion) (Dying Too Young. World Bank.).

Understanding economic burden of noncommunicable diseases is important for policy makers in order to set priorities and rationally invest scarce resources in health. The economic impact analysis will also help identify and implement cost-effective prevention strategies to tackle the issue of modifiable risk factors. Substantial costs can be avoided through reduction of preventable deaths and morbidity.
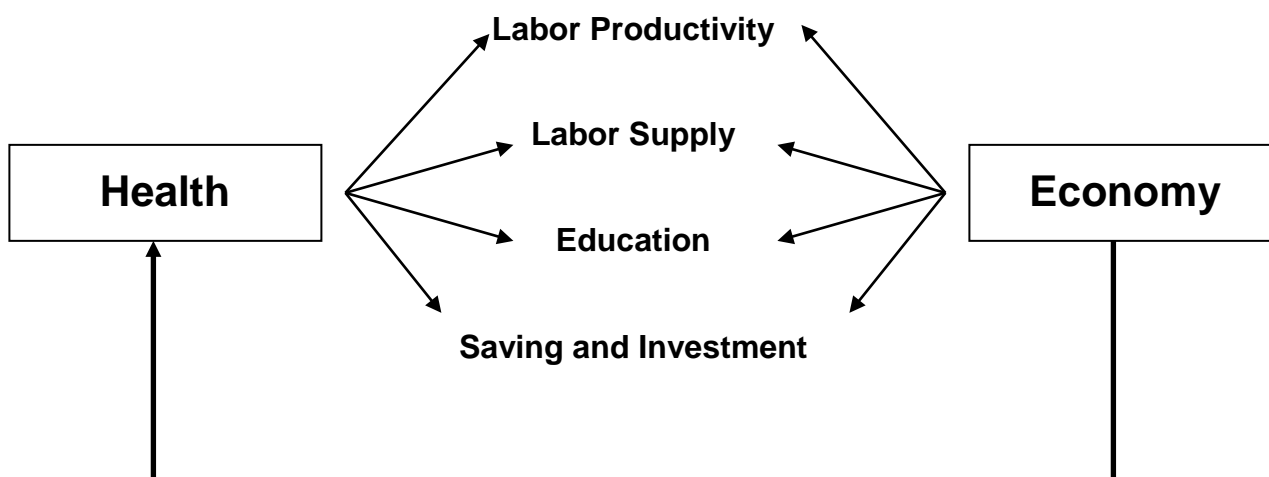
Despite the magnitude of the issue of chronic diseases in Azerbaijan its economic impact is unknown. This report focuses on the first step in describing the process of estimating the costs of selected chronic diseases in Azerbaijan. The main purpose of this report is to emphasize an urgent need for engaging health economics into the process of policy development and allocation of financial resources. While obtaining precise costs will be impossible given poor availability of required data, the estimates in this report will be based on very conservative assumptions to present approximate economic burden due to the selected chronic illnesses from the government perspective.

In light of lack of studies on economic impact of noncommunicable diseases in Azerbaijan this report attempts to identify available data, information gaps and research needs for such an analysis. This document is the first step in describing the process of estimating the costs of noncommunicable diseases in the context of the existing national health system.

2 Approaches to estimating economic impact

The impact of a disease on economy has been widely documented in numerous studies worldwide. The economic effects can be measured at the microeconomic level including the impact on households or businesses or the macroeconomic level such as the impact on a GDP and economic growth of the country. The mechanism of impact and interrelationship between health and economy is illustrated in **Figure 1**.

Figure 1: From Health to Wealth (and Back)

Source: Adapted from Bloom, Canning and Jamison (2004).

Healthier individuals are expected to be more productive both through increased activity and better use of technologies and equipment. Poor health may affect labor supply in two ways: withdrawal of labor force due to illness and increased labor supply by affected individuals and households to compensate loss of income if a social benefit system fails to render adequate support. Poor health may result in decreased performance at school and university which will ultimately reduce productivity of such individuals in future. Finally, healthier population with longer life expectancy is more likely to secure greater savings and invest in education and development.

Various models exist to quantify direct and indirect impact of a disease on economy. The economic effects can be presented in monetary terms or as an impact on gross domestic product (GDP) or GDP growth. Choosing an appropriate model largely depends on study targets and availability of required data. The table below describes major approaches used by health economists and data required for each model.

Table 1: Macroeconomic approaches to measuring the impact of disease and injury

Type of Study	Definition and aims	Data requirements
Cost of Illness	Estimates direct costs (medical care, travel costs, etc) and indirect costs (value of lost production from lower labor inputs) due to disease and injury	• Disease-specific epidemiological data (e.g. prevalence, incidence, mortality); • Direct costs (treatment, diagnostics, drugs, medical equipment, supplies, transportation, special food and other); • Indirect costs (work days lost,

		absenteeism, unemployment, wages or some other indicator of marginal productivity)
Growth regression	Estimates the impact of health indicators on GDP growth	• Economic data (GDP, capital stock, investment, Natural resources); • Demographic indicators (population age and gender, size of workforce); • Human capital (education, experience); • Epidemiological data (life expectancy, adult survival rates, prevalence, incidence, mortality)
Calibration models	Estimate the impact of health indicators on GDP or GDP growth	• Economic data (GDP, capital stock, investment, natural resources); • Demographic indicators (population by age and gender, size of workforce); • Human capital (education, experience); • Epidemiological data (life expectancy, adult survival rates, prevalence, incidence, mortality)
Computable general equilibrium models	Estimates the impact of health indicators on: • GDP or GDP growth • Sectoral and distribution impacts	• Disaggregated input-output matrices describing the overall economic structure; • Disease-specific epidemiological data (prevalence, incidence, mortality, duration of illness spells) • Parameters characterizing scenarios with and without the disease
Full income models	Seeks to estimate the impact of health indicators on economic welfare	• Economic data (GDP, real discount rates); • Value of statistical life, ideally by age, sex, and many other key factors

Source: WHO Guide to Identifying the Economic Consequences of Disease and Injury

The cost-of-illness model (CoI) is the most popular approach and is used to measure all or part of costs associated with a specific health condition. The results of CoI studies are increasingly used by governments and health care providers for policy development. CoI studies may estimate full costs or individual cost components, i.e. direct or indirect costs, depending on data availability and pursued goals.

Total costs of a disease include direct, indirect and intangible costs.

- **Direct costs** are referred to medical and nonmedical expenditures incurred by the government, individuals and other payers such as insurance companies and employers for treatment of a disease including inpatient and outpatient services, diagnostics, rehabilitation, medication and administrative costs.

- **Indirect costs** are the monetary value of lost productivity including lost earnings and costs of travel to and from the medical facility.

- **Intangible costs**, which are the most difficult component to measure, include pain, suffering, disability and overall reduction in quality of life.

The objectives of cost-of-illness studies can be viewed from different perspectives: the health care system, individuals, businesses or the society. In other words, they may

estimate the burden on patients and families, government or the whole society which is most preferred.

Table 2: Costs for cost-of-illness studies by perspective

Perspective	Medical costs	Morbidity costs	Mortality costs	Travel/ Nonmedical costs
Societal	All costs	All costs	All costs	All costs
Health care system	All costs	---	---	---
Third-party payer (insurance)	Covered costs	---	Covered costs	---
Businesses	Covered costs	Lost productivity (absenteesm)	Lost productivity	---
Government	Health budget	Lost productivity (absenteesm)	Lost productivity	Criminal justice costs
Patients and families	Out-of-pocket payments	Lost wages/ household production	Lost wages / household production	Out-of-pocket

Source: Adapted from Luce et al.

However, in Azerbaijan, where the greatest proportion of medical costs is incurred by the government and patients, the third-party payer and businesses perspectives would not be of significant importance. Estimating societal costs does not appear to be achievable in near future because of poor availability of necessary data.

Various techniques and methods are used in the cost-of-illness analysis: from very basic to highly sophisticated models. The basic approach to estimating CoI includes identification of direct and indirect costs per one episode. Once the costs of one episode are identified they are extrapolated to the affected population by using either prevalence, i.e. the total number of all existing cases during the year, or incidence rates, i.e. new cases of the disease during the year. The use of either approach depends on intended application of the study's results. The prevalence-based approach employed in the majority of studies estimates the costs of a disease incurred during a year. The incidence-based approach estimates the costs of an illness from its beginning till its end. The former methodology is useful for decision makers to understand the burden on the health budget caused by all cases of the disease including those which started before the year for which the costs are being estimated.   The incidence-based approach, however, is more useful for evaluation of preventive programs and is, therefore, considered more suitable for estimating the costs of chronic diseases in which preventable risk factors play a major role.

3 Noncommunicable disease epidemiology

Noncommunicable diseases represent the major burden in terms of mortality and morbidity in Azerbaijan. Being a leading cause of death, diseases of circulatory system, mainly coronary heart disease, myocardial infarction and stroke, accounted for 59% of all deaths in 2008 (State Statistical Committee, 2009). When comparing incidence rates, diseases of circulatory system were ranked the forth after infectious diseases, respiratory illnesses and injuries and poisonings and the second among the population of 30 years of age and older. Data on prevalence of cardiovascular diseases were not found available.

In 2008, cancer was ranked the second leading cause of mortality resulting in 6515 deaths or 12.3%. The top five cancer types include breast, lung, stomach, esophagus and colorectal cancers. 7377 new cases of malignant neoplasms were recorded in 2008 and the total number of such patients reached 25472 (State Statistical Committee, 2009). For the past few years increasing incidence and prevalence rates have been observed which, in part, can be explained by the implementation of the state health program targeting such patients.

Diabetes, another chronic illness which often leads to disability and death, is common in Azerbaijan and caused almost a thousand deaths in 2008. In total 73129 patients with Type 2 diabetes were registered by the Ministry of Health and 20353 new cases were recorded which is almost as twice as much than in 2007. This is explained by the ongoing implementation of the State Health Program on diabetes which provides free medication and glucometers to diabetic patients. The table below summarizes available statistics on prevalence and incidence of these three health conditions.

Table 3: Incidence and prevalence of selected diseases per 10,000 population (2008)

Disease	Incidence	Prevalence
Diseases of circulatory system	129.6	NA
Neoplasms	8.6	29.7
Diabetes	23.7	85.4

Source: State Statistical Committee (2009)

4 Health Financing in Azerbaijan

4.1 Health expenditure

Despite significant growth during last several years, per capita health expenditure remains at low level in Azerbaijan (see Table 4). Public health expenditure as a share of total government spending was around 4% in 2007 which is one of the lowest among the countries of WHO European region. Moreover this share has a tendency to decline which indicates that the government does not consider health sector among its major priorities.

Table 4. Trends in health expenditure in Azerbaijan.

	2000	2001	2002	2003	2004	2005	2006	2007
Total health expenditure as % of gross domestic product (GDP), WHO estimates	4.8	4.6	4.7	4.2	4.0	4.4	4.1	4.0
Total health expenditure, PPP$ per capita, WHO estimates	104	112	127	129	139	197	254	320
Government health spending as % of total government spending*	5.4	5.2	4.8	4.5	4.9	5.5	4.3	4.2

Sources:(World Health Organization 2009) *(State Statistical Committee of Azerbaijan 2009).

According to the Ministry of Finance of Azerbaijan, hospitals represented the biggest item in government health expenditure accounting for 55% of total spending in 2007. The second biggest item with 25% share was State Health Programs that targeted certain specific health conditions or categories of patients mainly covering centralized procured supply of equipment and/or pharmaceuticals. Policlinics and ambulatories that provide primary and some part of out-patient specialty care accounted for 17% of total public health expenditure.

In 2007, the majority of government health expenditure went to staff salaries (56%) followed by the purchase of goods and services including utility charges that accounted for 34% of total spending. The share of capital investment has been rising in recent years from around 3% in 1999 to more than 9% in 2007 (Holley, Akhundov et al. 2004; Ministry of Finance 2008a). More than 100 health facilities were constructed or fully rehabilitated in the past three years (Ministry of Health 2009c).

4.2 Revenue collection / sources of funds

Azerbaijan is among the few countries in WHO European region with predominantly private sources of health care funds. It needs to be mentioned, however, that the situation has started to improve since the mid 2000s with the rapid increase in the state budget and absolute allocations to health by the government. Currently, direct out-of-

pocket payments and general taxation revenues constitute the major sources of funding and the role of voluntary health insurance and donor funding is relatively small.

a) Compulsory sources of finance

Compulsory sources of health finance represented by general government revenues. The central government revenues come from a number of direct and indirect taxes as well as non-tax revenues such as the budget transfers from the State Oil Fund. The taxation of personal income is progressive but its share in the budget revenues is much smaller than the share of regressive consumption taxes, which reduces the progressiveness of the overall tax burden. In 2008, more than half of total government revenues were mobilized from the oil sector (The Ministry of Finance 2009). Hence, the volatility of the global oil price could result in important fluctuations in general revenues over time thus affecting ability of the government to fund health care.

As it was mentioned, the Government of Azerbaijan allocates a very small share of total government expenditure to health. According to WHO estimates following the national health accounts classification, government health expenditure as share of general government revenue was 3.6% in 2006 which represents 31.3% of estimated total health expenditure (THE) in 2008.

In January 2008 the Government of Azerbaijan took the political decision to introduce mandatory health insurance. The State Agency for Mandatory Medical Insurance was formally established, but was not yet operational at the time of writing.

b) Out-of-pocket payments

The low public health expenditures and undeveloped private health insurance market result in extensive direct out-of-pocket payments by patients that, according to WHO estimates, represented around 61.5% of total health expenditure in 2007. Out-of-pocket payments (OOP) are composed of formal user charges for services or pharmaceuticals not covered by state benefits; any payments made for services provided in the private health care sector; informal payments and gratuities.

The extent of OOP in the country is difficult to estimate precisely due to the absence of universally accepted approaches for calculation as well as the quality of data used. The State Statistical Committee (SSC) estimates OOP through regular household budget surveys (HBS) according to which the share of OOP represented 55.4% of THE in 2007 (State Statistical Committee of Azerbaijan 2009). However, the methodology used by SSC may not capture all household expenses for health care. The first WB-assisted Health Reform Project conducted the only comprehensive nationally representative survey of household health expenditures in 2004 (G&G Consulting 2004). The study estimated the mean household health expenditure as 4 times higher than the HBS finding for the same year. Based on these data the share of out-of-pocket payments in THE was estimated to be 80%. The vast majority of formal OOP were for outpatient pharmaceuticals. Outpatient expenditures represented the biggest share of all OOP (68.6%) followed by preventive care and other services (20.5 %) and hospitalizations (10.9%); of outpatient expenditures, 70.7% constituted payments for medical goods and drugs (G&G Consulting 2004).

More recent data on the level of OOP were provided by the baseline survey conducted in 7 districts under the second WB-assisted Health Sector Reform Project in 2006 (Project Implementation Unit 2007). The study estimated per capita OOP at 54.8 AZN (US$65) per year, which is also significantly higher than HBS findings for 2006 (31.2 AZN (US$37)) (Djibuti, Rukhadze et al. 2007). Regardless of methodology used and implementing agency, all household surveys show the predominance of OOP as a source of health financing in Azerbaijan. The danger of such high levels of OOP is in its ability to create financial barriers for access to health care for poor sections of the population.

c) Other sources of funds

Other sources of funds for health care include external grants and loans as well as voluntary health insurance (VHI).

The international assistance for health used to be significant during mid-1990s and according to some estimates represented up to 25% of public funds for primary care in the country (World Bank 2005). From the mid-2000s major donors discontinued humanitarian aid and shifted their strategies towards development assistance. Currently international partners working in the health sector are the Global Fund to Fight HIV/AIDS, Tuberculosis and Malaria (GFATM), the World Bank (WB), United States Agency for International Development (USAID), UN agencies (WHO, UNICEF, UNDP, UNFPA), the Global Alliance for Vaccines and Immunization (GAVI) and other bilateral and multilateral actors. Total international assistance in health could be estimated at US$20 million annually which would represent around 2% of total health expenditure in the country.

Despite rapid development in recent years VHI still represents insignificant share of THE. The range of estimates vary from 0.7% to around 2% of total health expenditure in 2007 (World Health Organization 2009 and Zoidze 2008 respectively).

4.3   Pooling of funds

The health financing system in Azerbaijan is very fragmented with the Ministry of Health (MoH) and 65 local (rayon) administrations representing the main pools. The Ministry of Finance provides funds to the MoH for republican hospitals, tertiary facilities, scientific-research institutes the network of centers of hygiene and epidemiology (former SES). Also, as of 2006 all public health facilities formerly funded through Baku City local authorities receive their funding from the MoH. In addition, MoH controls the resources allocated for various state health programs which mainly cover the centralized purchase of program-specific drugs, medical supplies and equipment. In 2008, the share of budgetary allocations for health controlled by the MoH represented around 63% of all expenses. The remaining 37% went to local administrations which fund primary and secondary state facilities within the rayon boundaries (Ministry of Finance 2008). As there is no mechanism for the redistribution of funds between district health departments, the funds allocated for local administrations can be viewed as 65 separate pools which fragment the financing system further.

4.4 Purchaser-provider relations and purchasing of services

The Azerbaijani health care system is characterized by an integrated model of purchaser-provider relations where the providers are owned by the payers. The public health providers as state institutions have very limited financial and managerial autonomy and there is a tendency towards a reduction in the autonomy of actors further down the hierarchy of the system.

Public health care facilities are paid based on the amount of inputs such as number of beds or staff through prospective fixed line-item budgets typical to Semashko model of health care. A hospital will get payment regardless of whether it has no patients or is fully occupied. Moreover, under-spending is penalized through reductions in the allocations for the next year because the budgeting process is based on historic expenditures. The payment mechanism does not provide any incentives for hospital administrators to reduce costs to improve efficiency and there is no mechanism under current payment arrangements to reward better performing facilities; nor is there any competition for funding between providers

Despite the fact that the legislation allows different options in paying health care personnel, in reality almost all health care workers in public health facilities are salaried employees. The salary level for an individual employee is defined based on the Unified Tariff Scale which is applied to all public sector employees and consists of 19 levels with the lowest level being equivalent to the minimum salary in the country

5 Costs of Noncommunicable Disease in Azerbaijan

5.1 Data sources

Overall the national health information system suffers from incompleteness and poor quality of data and, therefore, very limited information for estimating costs of illness is available. In addition, no surveys which would supply relevant data have been conducted to date. The only data which was found somewhat appropriate was the number of hospital discharges and total length of hospital stay by disease groups which is collected by the Department of Health Information and Statistics from public medical facilities (Form 14).

Private health insurance companies were also examined as a potential source of data for estimating direct treatment costs. Each private health insurance company maintains a database which includes information on payments to private medical institutions by health conditions. The databases also specify services provided i.e. diagnostics, outpatient consultations, hospitalizations and medication. The limitation of this data source is that most health insurance programs do not cover many chronic conditions in particular those which are addressed by the National Health programs including cancer and diabetes. However all insurance programs cover injuries and, therefore, this data can be used for estimating the costs of illnesses from external causes. While using such information it shall be kept in mind that insurance companies usually negotiate discounted prices with private medical providers and, therefore, costs incurred by uninsured patients are 10-20% higher. Another limitation of this data source is that charges by private medical providers will not accurately reflect actual medical costs and may vary significantly depending on the provider's pricing policy. This data source, however, can be appropriate for estimating cost of illness from individual perspectives. A better source of cost information would be accounting records of health providers which can though be difficult to access for researchers.

5.2 Direct government costs

The vague mechanisms of the health financial system inherited from the Soviet past for formulating the national health budget and allocation of financial resources are the greatest challenge for identifying medical costs for a specific health condition. Surveys conducted within the studies on reforming the health financing system attempted to estimate costs of hospital stay by health condition but failed to result in valid figures. In particular, the survey conducted in 2007 in two pilot districts within a project on the development of financing policy attempted to estimate medical costs per admission by specialty in hospitals and outpatient facilities. The researchers used a step-down allocation method but admitted that their estimates did not reflect actual costs of hospital stay by specialty due to poor quality of financial and clinical data at government medical facilities.

The estimates presented in this report are referred only to medical facilities under the Ministry of Health which is a major payer. In addition, no data is available for parallel services and private medical institutions to include them in the analysis. It would not be correct to refer to the costs estimated in this report as treatment or medical costs because they also include administrative and capital investment costs. In other words,

these estimates represent a share of the state health budget spent for the selected chronic diseases.

The structure of the state health budget for 2008 was as follows:

Total health care budget	385,800,000	100%
1. Polyclinics and ambulatories	52,158,000	13.5%
2. Hospitals	187,844,000	48.7%
3. Other services in healthcare field	6,585,000	1.7%
4. Research in healthcare field	2,562,000	0.7%
5. Other services related to healthcare field (including State Health Programs)	136,650,000	35.4%

Data on hospital discharges and length of stay by health condition was derived from the Ministry of Health statistics. The average costs of one day of hospital stay per patient were estimated from government expenditure for hospitals and total length of stay which is, obviously, a significant approximation. To distinguish between the costs of different health conditions weighted coefficients for each disease group are being developed in a study within the project on the development of a Program on Introduction of a New Health Financing System by the Project Implementation Unit of the Ministry of Health. It is expected that the coefficients will be finally identified in 2010 after 100,000 records from hospitals are collected.

Table 5: Public health expenditure on inpatient care for selected chronic diseases (2008)

Disease	ICD-10	Length of stay >15 year old	Estimated costs (thousand AZN)
Total	A00-Z99	7,362,684 (all ages)	187,844
Cancer	C81-C96	172,596	4,401
Circulatory system diseases, total	IX	989,259	25,226
Hypertension disease	IX.3	260,257	6,636
Myocardial infarction	IX.4	68,918	1,757
Other acute and semi-acute ischemic heart conditions	IX.5	46,944	1,197
Angina pectoris	IX.6	123,009	3,137
Other chronic ischemic heart conditions	IX.7	77,588	1,978
Cerebrovascular disease, total	IX.8	95,336	2,431
Subtotal	IX.3-IX.8	672,052	17,137
Type 2 Diabetes	IV.4	53,971	1,376

Source: Department of Health Information and Statistics of the Ministry of Health (2009)

By using this extremely simplified approach the average government spending per one day of inpatient stay would be 25.5 AZN per day per bed. Thus, total expenditure for inpatient care due to cancer, circulatory system diseases and type 2 diabetes would total 48.1 million AZN or 25% of the budget allocated to inpatient care in 2008. More than 50% of these costs were spent for patients with diseases of cardiovascular system.

Notably, costs of hypertensive disease were the highest among all presented conditions due to greater number of hospitalizations and longer hospital stay per patient. Government expenditure for hospital care for patients with cancer and type 2 diabetes accounted for only 2.3% and 0.7% of total inpatient costs. These estimates, however, do not include the budget allocated for cancer and diabetes patients through the State Health Programs that would further increase the costs of these conditions. In 2008, 13.8 million AZN were allocated for the program on diabetes and 5.0 million AZN were allocated for the program on provision of oncological patients with main anti-tumor medicines. With the assumption that costs of treatment for type 1 and 2 diabetes are identical, 11 million AZN are estimated to be spent for type 2 diabetes patients. However these programs are mostly implemented through primary health care facilities and would primarily affect outpatient costs. When these costs are added to the estimated inpatient costs, total government expenditure for cardiovascular disease, cancer and diabetes will be over 64 million AZN or 16.5% of the total health care budget.

It appears that available data render little help for estimating outpatient costs of chronic health conditions. With 4.7 outpatient contacts per capita (Health for All Database. WHO) and allocated budget for outpatient and ambulatory services, very rough estimates of costs per outpatient contact result in a very low value of 1.32 AZN per outpatient contact. No reliable data on unit costs of outpatient services by illness was found available to include in the analysis.

The estimates above are referred only to spending in medical facilities which belong to the Ministry of Health. Health facilities run by other ministries and companies are funded by respective agencies and estimated to serve around 5% of the population (Holley, Akhundov et al. 2004). In addition to serving agencies' employees and their families these facilities also admit general population on a paid basis.

5.3 Indirect costs

It appears that estimating indirect costs is a significant challenge due to lack of required data. Given the fact that most of specialized hospitals and private medical facilities are located in the capital, travel costs incurred by patients who live in the regions may be significant. However, to date no surveys have been conducted to collect data on such expenses.

Absenteeism results in both direct and indirect costs. The direct costs are benefits paid to sick employees by employers and the pension fund. The indirect costs are incurred as a result of reduced productivity. Outpatient clinics collect stubs from sick leave certificates and compile annual reports for health departments. The reports include information on number of issued sick leave certificates and total length of absenteeism

by illness. The review of the data received from the Baku Health Department showed that its quality and completeness appears to be poor.

6 Conclusion and recommendations

Azerbaijan population is experiencing high morbidity and mortality rates due to noncommunicable diseases including cardiovascular disease, cancer and type 2 diabetes. Many deaths can be avoided through prevention programs and strategies. However, decision makers in Azerbaijan need to be provided with information on economic burden of chronic conditions in order to implement cost-effective solutions.

It appears that no studies have been conducted in Azerbaijan to estimate the economic impact of noncommunicable diseases and, therefore, there is a need to provide decision makers with information which will allow to rank public health issues and address diseases in a prioritized manner. Estimating the costs of modifiable risk factors will contribute to developing effective prevention policies and interventions. The Azerbaijan Government implements eight Sate Health Programs two of which address chronic health conditions: cancer and diabetes. All eight programs consume almost 25% of the state health expenditure but have never undergone economic evaluation.

It was identified that existing data appears to be insufficient for producing a valid economic impact analysis. In addition, existing statistical data from official sources is still incomplete and inaccurate. The outdated health financing system and flaws in reporting further complicate attempts to estimate costs associated with chronic diseases.

Out-of-pocket expenses for medication and services in particular those payments which are made informally remain the major issue in estimating costs of treatment in Azerbaijan. Despite the fact that a number of reports presented the estimates of such costs there is still no consensus on medical expenses incurred by patients.

The very basic estimates presented above show that over a quarter of the public health budget allocated for hospitals in 2008 was spent for patients with cancer, cardiovascular disease and type 2 diabetes. Review of available data on spending for outpatient services showed that no valid estimates of outpatient costs can be concluded at this time even with significant approximation. However an ongoing program on reforming the health financing system is expected to supply more data on medical costs in near future.

Recognizing the value of economic impact studies for national health care institutions the following suggestions should be considered for future work:

- There is overall need to improve quality of financial and accounting data at health provider level. National Health Accounts need to be introduced for better understanding of financial dimensions of the health care system.

- Given the existing issues with quality of financial and clinical data, surveys seem to be the most reasonable approach for understanding actual expenditures for chronic health conditions from both government and individual perspectives.

Such surveys will need to collect data in relation to direct and indirect costs for a specific disease. Private medical facilities and health insurance companies may become an important source of reliable information on direct medical costs. Another method which can be used to determine direct treatment costs is to develop cost estimates through physician panels who would identify a typical treatment course for a specific health condition.

- Research capacity need to be improved through training and studies in collaboration with international research institutions.