AMERICAN UNIVERSITY OF ARMENIA
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Health in Times of Transition

Rapid Appraisal of Diabetes Care in Armenia

Qualitative Research

Collaborative Research between

College of Health Sciences

American University of Armenia

and

London School of Hygiene and Tropical Medicine & Curatio International Foundation

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Abbreviations

AUA- American University of Armenia
CHSR- Center of Health Services Research and Development
CHS- College of Health Sciences
CVD- Cardio-vascular disease
FAP- Rural health post (from Russian abbreviation)
FGD- Focus group discussion
FP- Family Physicians
GP- General Practitioner
HSPA- Health Sector Performance Assessment
IDI- In-depth interview
LSHTM- London School of Hygiene and Tropical Medicine
MoH- Ministry of Health
NCD- Non-communicable disease
NIAC- National Information-Analytic Center
PHC- Primary health care
RA- Republic of Armenia
SHA- State Health Agency
WHO- World Health Organization

Executive Summary

Diabetes-related morbidity, disability and mortality are growing public health concerns in Armenia. According to the World Health Organization (WHO) the diabetes mortality rate in Armenia in 2009 was higher than in Georgia- with 46.5 deaths per 100 000 population compared to 10.5 deaths per 100,000, respectively. Diabetes morbidity and mortality rates have increased in Armenia during the last ten years. According to the International Diabetes Federation (IDF) estimates, the diabetes morbidity rate is projected to increase by 0.9% annually in Armenia from 2010 to 2030; which means every tenth citizen in Armenia would have diabetes in 2030.

Concerned with the increasing trends of non-communicable diseases (including diabetes) morbidity and mortality in Armenia, the Ministry of Health (MoH) of Armenia developed national strategies on three of the most prevalent non-communicable diseases in Armenia- cardiovascular diseases (CVDs), malignant neoplasms, and diabetes, which were approved by the Government of Armenia on April 14, 2011. The main aim of the *Diabetes Prevention Strategy is* to improve diabetes care in Armenia.

Currently, the primary health care (PHC) general practitioners (GPs) and polyclinic endocrinologists monitor diabetes patients. These physicians refer diabetes patients to hospitals and diagnostic canters for a more thorough diagnosis and treatment as needed. Diabetes patients registered at PHC facilities are eligible to periodically receive their insulin and anti-diabetic drugs free-of-charge.

The Center of Health Services Research and Development (CHSR) of the American University of Armenia (AUA) in collaboration with the London School of Hygiene and Tropical Medicine and Curatio International (LSHTM/Curatio) conducted a study to assess the diabetes health care system in Armenia. The aim of the study was to provide a snapshot of the pathways persons with diabetes access and navigate the health care system.

The research utilized a qualitative study methodology to evaluate diabetes health care services through focus group discussions and in-depth interviews. The study took place in Yerevan (the capital city) and Shirak marz (one of the 10 provinces in Armenia) to understand diabetes care at national and regional levels. Overall, there were 91 study participants (80 female and 11 male) living in Yerevan and Shirak marz (including Gyumri city and Shirak village). Six groups of participants took part in the study: 1) primary health care physicians – general practitioners (GPs) or family physicians(FP) and nurses, 2) endocrinologists working at primary health care facilities, 3) hospital endocrinologists, 4) other specialists who deal with diabetes complications (such as diabetic foot complications and diabetic retinopathy), 5) policy makers/experts and 6) diabetes patients (18 years old and over and having type I or type II diabetes, with and without complications). The Institutional Review Board of the American University of Armenia and the Ethics Committee of the London School of Hygiene and Tropical Medicine approved the study for compliance with locally and internationally accepted ethical standards.

The study found several positive factors that enhanced access to diabetes care in the country, which included the existence of an infrastructure for diabetes care, overall sufficient number of trained endocrinologists in the country to cover the demand, free distribution of insulin and some anti-diabetic drugs to diabetes patients at the polyclinics, and improved access to insulin.

Despite these achievements, there were many shortcomings in diabetes care that were identified during the study. The main obstacles for effective diabetes management in the country were associated with a shortage of supply of anti-diabetic drugs, which placed a heavy financial burden on diabetes patients, irregular changes in the types and brands of the anti-diabetic drugs leading to destabilization of patients' blood glucose levels and increasing the risk of complications, expensive consumables (glucometers, strips and syringes) and high prices of advanced laboratory testing and Doppler examination reducing the effective monitoring of their disease.

The high social stigma associated with diabetes and insulin-use was identified as one of the underlying factors for poor compliance to treatment, especially among younger diabetes patients. There was a poor coordination of efforts between diabetes care in polyclinics, hospitals and private medical centers that provide care to more complicated cases. Lack of coordination and communications between these institutions threatens the quality of diabetes care and potentially puts diabetes patients at greater risk for complications.

Based on the literature review, study findings and recommendations provided by the study participants, the research team developed a set of feasible policy recommendations that could improve diabetes care. Increasing financing for diabetes care, expanding the coverage of free or discounted anti-diabetic drugs and other drugs needed for care of diabetes complications, establishing a unified diabetes registry for effective communications and coordination between caregivers and organizing population-based educational campaigns on diabetes to reduce stigma were among the major recommendations to improve diabetes health care in Armenia.

1. Introduction

Republic of Armenia (RA) is located in South Caucasus. Armenia is a mountainous country and has a continental climate with hot summers and cold winters.[1, 2] In 1991,Armenia became independent from the Union of Soviet Socialist Republics (USSR).[2]

Armenia has a population of 3.2 million. The official language is Armenian and predominant religion is the Armenian Apostolic Church.[2]

RA is divided into ten provinces (marzes) and the city of Yerevan which is the capital city. Each marz is a self-governing state and consists of urban and rural communities. Approximately 64% of the population live in urban areas.[3, 4]

2. Study objectives

The aim of the study was to provide a snapshot of the way people with diabetes access and navigate the health care system. This is a collaborative study between the Center of Health Services Research and Development of the American University of Armenia (CHSR/AUA) and London School of Hygiene and Tropical Medicine and Curatio International Foundation (LSHTM/Curatio).[5]

More specific objectives were:

1. Describe the system for diabetes care in the country and assess linkages between these and other general primary health care and curative activities.
2. Describe how patients with diabetes obtain health care and, in particular, a regular supply of insulin, other medication, and equipment to monitor blood glucose.
3. Identify what obstacles confront both people with diabetes and health professionals providing care and how they seek to overcome them.
4. Assess how well diabetes care is integrated within the health system.
5. Propose changes that would improve delivery of care for people with diabetes in Armenia.

3. Methods

3.1. Study design

To evaluate diabetes health care services in the country, the study team developed and implemented a qualitative study (in-depth interviews and focus group discussions). The research team applied comprehensive and rigorous assessment methodologies[6-9] to explore the perspectives of policy makers/experts, health care providers (endocrinologists, PHC providers, and other specialists), and diabetes patients about diabetes management in Armenia.

3.2. Study setting

The study took place in Yerevan, the capital city, and Shirak marz, one of the 10 provinces in Armenia to understand diabetes care at the national and regional levels (Table 1). The CHSR/AUA, in consultation with the LSHTM/Curatio research team, selected Shirak marz based on the following criteria: being poor; being away from the capital city; and having communities that were observed during the HiTT Survey 2010. "Social Snapshot and Poverty in Armenia 2008" report by the National Statistical Service of Armenia suggested: "With almost 32.1% of the population below the poverty line, Shirak, a high altitude marz devastated by an earthquake in 1988, was still the poorest in Armenia."[10] Moreover, it is far away from Yerevan and has communities that HiTT Survey 2010 observed (e.g., Shirak village). Within Shirak marz the data collection took place in the main city Gyumri and Shirak village.

3.3. Study participants

The CHSR/AUA research team identified key informants using purposive sampling methods to provide pertinent information for the assessment, based on participants experience and expertise in diabetes health care services in Armenia.

Due to the complexity of the assessment, the CHSR/AUA team used multiple purposive sampling techniques which included representativeness or comparability and sequential approaches.[7] Six groups of participants took part in the study 1) primary health care physicians – general practitioners (GPs) or family physicians(FP) and nurses, 2) endocrinologists working at primary health care facilities, 3) hospital endocrinologists, 4) other specialists who deal with diabetes complications (such as diabetic foot complications

and diabetic retinopathy), 5) policymakers/experts, and 6) diabetes patients (18 years old and over and having type I or II diabetes, with or without complications).

3.4. Research instruments

The CHSR/AUA team developed in-depth interview and focus group discussion guides based on the sample guides provided by the LSHTM/Curatio "Rapid Appraisal for Diabetes Care Toolkit" and considering conventional qualitative research methods.[5] The guides were designed to optimize the value of the data collected to meet the objectives of the qualitative study. The questions in each guide were adapted to specific participants' roles, responsibilities and professional/individual experience in the areas related to diabetes care. The guides were progressively adapted based on the data collected in previous in-depth interviews or focus group discussions. The CHSR/AUA team developed a short demographic information form to be completed by participants after each focus group discussion. The CHSR/AUA team developed all guides in English and translated into Armenian. Appendix 1 and 2 provide samples of qualitative study guides.

3.5. Data collection and analysis

The CHSR/AUA research team conducted all the in-depth interviews and focus group discussions. Each focus group had a trained moderator and a note-taker. These roles were rotated among the CHSR/AUA research team members. The interviews and FGDs were audio recorded with permission of all study participants. All FGDs and in-depth interviews were transcribed. The qualitative study followed the research methods of heterogeneity and triangulation, and terminated when saturation was achieved.[7] After data collection, the CHSR/AUA team used advanced analytical qualitative research methods to analyze in-depth interview and focus group discussion transcripts utilizing conventional inductive and directed deductive content analysis techniques.[7-9] The CHSR/AUA team used realistic evaluation of complex social systems, 'context + mechanism = outcome' [11, 12] model (described in the "Diabetes Rapid Appraisal toolkit") to present the study findings which are based on three key elements: 1) Inputs, 2) Mechanism, and 3) Outcomes. The research team developed subcategories to further analyze the data.

The fieldwork for the qualitative assessment took place in September-November 2011[i], and the research team recruited 91 study participants (80 female and 11 male participants) living in Yerevan and Shirak marz (including Gyumri city and Shirak village). Majority of study participants were enthusiastic to participate in the discussions. However, health providers and policy makers/experts agreed to participate only after getting a support letter from the Ministry of Health. In addition, three participants left the focus group discussions earlier. Only one key informant refused to participate.

Overall, 67 people participated in 12 focus group discussions (FGDs) in Yerevan and Shirak marz. The mean duration of focus group discussions with providers was 47 minutes and with diabetic patients 59 minutes.

Six of the FGDs involved primary health care general practitioners, PHC endocrinologists, and hospital endocrinologists (see Table 2 for details). Twenty six health care providers (PHC GPs, endocrinologists and hospital endocrinologists) lived in Yerevan and 10 in Shirak marz. The mean age of health care providers was 42 years, the majority of them were women (only one man), all PHC providers were employed in public facilities, the secondary level endocrinologists were employed both in private and public facilities (six in public and four in private facilities), the mean professional experience of providers was 15 years, on average PHC GPs had 267 diabetic patients enrolled and hospital endocrinologists consulted 3-4 diabetic patients per day (Table 2).

Six FGDs involved diabetes patients (three groups in Yerevan, two in Gyumri and one in Shirak village) (see Table 3 for details). Overall 31 diabetes patients (type I and II diabetes, with and without complications) participated in FGDs – 17 of them lived in Shirak marz and 14 in Yerevan. The majority of diabetes patients, who participated in FGDs had type II diabetes (21 cases), mainly with complications, on average they had diabetes for 10 years (see Table 3 for details).

The research team also conducted 24 in-depth interviews with key-informants (Table 4) - policy makers/experts (11 key informants), health care providers (seven providers including a

[i]The research team could approach most of the study participants only after receiving the Ministry of Health agreement/official letter to conduct the study, since policy makers/experts and providers refused to participate without having a prior agreement with the Ministry of Health. The letter was received on October 12, 2011.

PHC nurse and GP, hospital endocrinologists, and other specialists) and diabetes patients with complications (six patients). Majority of in-depth interview participants lived in Yerevan (18) and the rest in Shirak marz (6). The mean duration of interviews with policy makers/experts was 50 minutes, with health care providers - 54 minutes, and with diabetic patients - 33 minutes.

Policy makers/experts were mainly responsive during the interviews, some were more open and specific, and others (a few of them) were brief and general in their answers. GPs and endocrinologists were very active during the discussions and expressed their concerns and suggestions without reservations. Overall, these discussions were very productive and helped to have a clear understanding about the gaps in diabetes health care system in Armenia. Hospital endocrinologists, particularly in Shirak marz, were very enthusiastic during the interviews and presented the problems in their region openly and clearly. The majority of endocrinologists employed in Yerevan hospitals were active and provided valuable information; however, a few participants were very brief and less informative during the discussions. Other specialists were very supportive and sincere and helped to complete the information received from other participants about the gaps in the management of diabetes complications in Armenia.

Diabetes patients were the most active and open participants during the in-depth interviews and FGDs. They presented their experience and concerns about diabetes health care services in Armenia and appreciated very much that they had the opportunity to express their thoughts in friendly discussions.

3.6. Categorization of study participants

The direct quotes provided in the boxes in the Results section were abstracted from both in-depth interviews and focus group discussions. Study participants were categorized into six groups: 1) policy maker/expert, 2) hospital endocrinologist, 3) PHC endocrinologist, 4) PHC provider (physician or nurse), 5) other specialist, and 6) diabetes patient.

Policymakers/experts were professionals employed in the field of diabetes care and involved in development and implementation of health policies and had extensive professional experience in diabetes care in Armenia; hospital endocrinologists were doctors from hospitals; PHC endocrinologists were doctors engaged in diabetes care in polyclinics – PHC

facilities; PHC providers (doctor or nurse) were providers employed in PHC facilities (polyclinic, village ambulatory or FAPs); other specialists were doctors dealing with complications among diabetes patients in hospitals; diabetes patients were patients (aged 18 and over) having either type I or type II diabetes with or without complications.

The individual informant identifiers (e.g., Policymaker/expert 1.A.1.) specify the category of participants who provided the quote and indicate if the same participant provided more than one quote within a single box. A single informant who provided quotes in more than one box has different identifiers for each box. After each identifier, the CHSR/AUA researchers indicated whether an individual participated in a focus group discussion or in-depth interview, and the geographic area of his/her practice or residency (Yerevan versus Shirak marz).

3.7. Ethical considerations

The Institutional Review Board of the American University of Armenia and Ethics Committee of London School of Hygiene and Tropical Medicine approved the study for compliance with locally and internationally accepted ethical standards. All participants were informed about their rights (their participation was voluntary, they could stop at any time and refuse to answer any question they chose, and their anonymity and confidentiality were fully respected). Audio-recording was possible only with permission of all participants; if a participant did not want to be audio-recorded, only written notes were taken. The final report does not contain respondents' names, positions, institutions, or any other details that could identify the participants.

4. Overview of diabetes services

4.1 Diabetes burden in Armenia

Diabetes-related morbidity, disability and mortality are growing public health concerns in Armenia. According to the World Health Organization (WHO) estimates, diabetes mortality rate in Armenia in 2009 was higher than in Georgia with 46.5 deaths per 100,000 population compared to 10.5 deaths per 100,000,respectively.[13]

According to the National Information Analytic Center's (NIAC) *Annual Health Statistical Report*, diabetes incidence rate increased almost three-fold over the last ten years, from 96.1 per 100,000 in 2000 to 264.9 in 2010 for the population 15 years old and over. Diabetes

prevalence increased in the last ten years from 1,331.3 per 100,000 population in 2000 to 2,056.4in 2010. Diabetes morbidity rates have been increasing in the last ten years among children 0-14 years-of-age from 17.6 per 100,000 population in 2000 to 41.6 in 2008.[14] Table 5 provides diabetes morbidity and mortality rates for the last ten years in Armenia. Diabetes mortality rate remains high in Armenia: from 2000 to 2003 it increased from 30.3 to 53.3 per 100,000population and then from 2004 to 2010 slightly decreased from 50.2 to 42.8 per 100,000 population, still remaining the third leading cause of mortality in Armenia.[14, 15] National statistics does not provide data on diabetes complications.

In 2010 there were 9,938 insulin dependent and 45,034 insuin independent (those who receive only anti-diabetic drugs) diabetes patients in Armenia.[16]

According to the International Diabetes Federation (IDF) estimates, the diabetes morbidity rate is projected to increase by 0.9% annually in Armenia from 2010 to 2030; which means every tenth citizen in Armenia will have diabetes in 2030.[15] Disability Adjusted Life years (DALYs) lost due to diabetes in Armenia are higher than in Georgia with 728 DALYs per 100,000 population for Armenia vs.227 DALYs for Georgia.[15]

4.2 Diabetes risk factors in Armenia

The increases of diabetes morbidity and mortality may be associated with the increasing rates of type II diabetes risk factors in Armenia, such as inappropriate diet, obesity/overweight, and low physical activity. Existing research shows that the Armenian diet is relatively high in fat.[17] In addition, the common consumption of high sugar jams and canned fruit, salt and oil-rich canned vegetables, and preserved meat with high levels of saturated fats, cholesterol and sodium, are among unhealthy dietary habits of Armenians.[17]

According to the Armenian Health Sector Performance Assessment 2009, the prevalence of overweight or obese (body mass index > 25.0) among the general population (adults aged 15 and over)was 51.8% among men and 45.8% among women. The overweight/obese prevalence increased with age- the prevalence was 13.5% in the age group 15 - 19 years old and 65.0% in the age group older than 40 years old.[18]

In 2009, 17.5% of people aged 15 years and over had less than 30 minutes of exercise per week. The proportion of people who were not physically active increased with age. More women were not physically active than men - 22.3% and 10.4%, respectively.

A study on risk factors for development of angiopathy of lower extremities in type II diabetes patients living in Yerevan conducted in 2007 found that inadequate foot self-checking after diabetes diagnosis confirmation, poor blood glucose control, smoking, hypertension, high BMI, and longer duration of the disease contributed to the development of diabetic angiopathy of lower extremities in type II diabetes patients.[19]

4.3 National strategy on diabetes

Considering the increasing trends of diabetes morbidity and mortality in Armenia, the MoH of Armenia developed national strategies on three of the most prevalent non-communicable diseases in Armenia - cardiovascular diseases (CVDs), malignant neoplasms, and diabetes; the Government of Armenia approved these strategies on April 14, 2011.[15, 20] There were no specific national documents/strategy on prevention of diabetes or other non-communicable diseases before this strategy.

The aims of the *Diabetes Prevention Strategy* are to:

1. prevent and delay the development of diabetes among all population groups,
2. reduce diabetes complications in order to improve diabetes patients' and their family's quality of life and wellbeing,
3. implement WHO accepted best practices for diabetes prevention, detection and effective management in Armenia to reduce the burden of the disease,
4. implement cost-effective and affordable diabetes detection and treatment services for all population groups in Armenia which will help to reduce the volume of informal payments in the country.[15]

To achieve these aims the Strategy defines several activities, which include:

1. implementation of screening programs among risk groups,
2. increasing population awareness on diabetes,
3. developing clinical guidelines and standards for diabetes treatment,
4. establishing a diabetes surveillance system, and

5. implementing mechanisms on diabetes data collection in primary health care (PHC) facilities.[15]

The State budget should cover financing of these activities in combination with resources from international organizations. The timeline of the national strategy suggests starting those activities in 2012.[15]

4.4 Organisation and management of diabetes care

According to *The Standard (protocol) on Free Outpatient Health Care Services*(provided under the State order, approved by the Minister of Health Order N 1993-A in December 2010),dispensaries should provide free specialized outpatient care for endocrine disorders (including diabetes) or if there are no dispensaries available primary health care endocrinologists or family physicians should provide free specialized care. Currently, there are two dispensaries in Armenia - the City Endocrine Dispensary, which provides technical support for endocrinology services in Yerevan polyclinics, and provides specialized consultations for adult diabetes patients as needed, and Children Republican Endocrine Dispensary that deals with care of diabetes children.[21] In addition, there are 38 polyclinics, 252 village outpatient centers, 617 FAPs in Armenia that are involved in diabetes care.[14]The same standard protocol clarifies that laboratory and instrumental diagnostic tests (particularly, the regular blood glucose test and funduscopy) are provided to diabetes patients for free in PHC facilities. If the PHC facility does not have the capacity to provide the required tests, it can contract with other facilities with the necessary capacity. The number of tests are estimated according to the number of enrolled population in a specific PHC facility and the State Health Agency of the MoH allocates a fixed budget to each facility according to the estimates for laboratory and instrumental diagnostic tests.[22] There are three in-patient endocrine departments in three hospitals of Yerevan; in some marzes (such as Shirak marz) there are some beds for endocrine patients in the general therapeutic departments of hospitals. In addition, there are private clinics that may provide consultancy and care to diabetes patients on a private basis.

According to the Chief Endocrinologist, Armenia was a signatory to the St. Vincent declaration in the past; currently the country is a member of the International Diabetes Federation and follows their recommendations and guidelines.

Endocrinologists in polyclinics are responsible for 1) the final diagnosis, treatment and follow-up of diabetes patients enrolled in their facility, 2) referrals of primary insulin dependent diabetes patients to secondary health care facilities or diagnostic centres for advanced diagnosis and corrections in insulin dosage, 3) referrals to other specialists for consultations as needed,4) administering rehabilitative treatment, and 5) referring diabetic patients to the medico-professional committee for determination of disability status for eligibility to receive social benefits.[22]

PHC physicians -general practitioners (GPs) and family physicians (FPs), are responsible for prevention, early detection and referral of diabetes patients to polyclinic endocrinologists for further consultation, verification of diagnosis and treatment, as well as for monitoring their chronic patients including visits to these patients.[21]

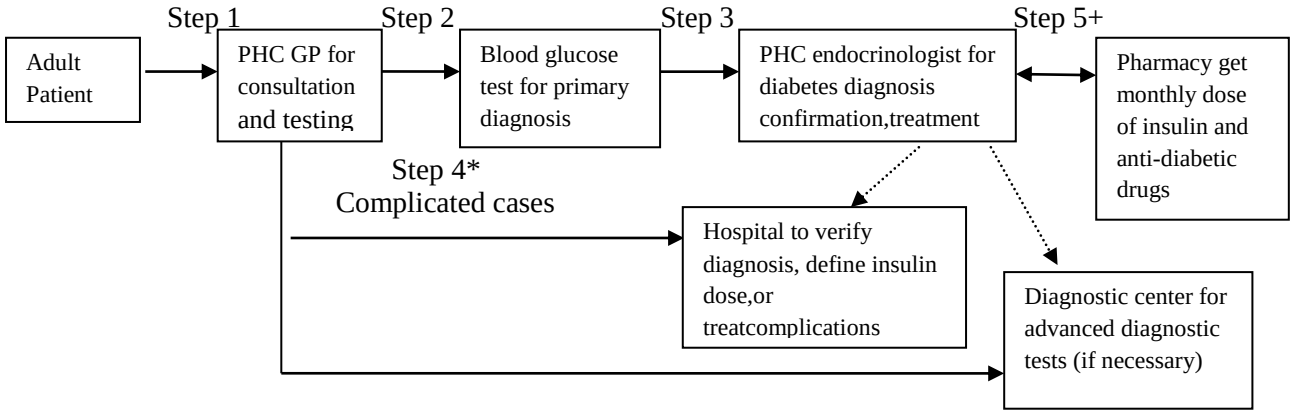
In rural communities, FPs working in health centres, village outpatient centres, family medicine centres and associated FAPs[ii] (rural health posts from Russian abbreviation) provide diabetes care, including diagnosis and treatment. If there is no FP serving these facilities, the endocrinologist in the regional polyclinic is responsible for care of the patients from those areas. The *Standard (protocol) on Free Outpatient Health Care Services* does not specify the role of nurses in diabetes care. These providers can also refer their diabetes patients to diagnostic centers and in-patient facilities for treatment as needed. If the necessary laboratory tests and instruments are not available in these rural facilities, regional polyclinics or hospitals may provide these services by contract with the referring PHC facility.[21]

The *Standard (protocol) on Free Outpatient Health Care Services* also requires that every diabetes patient enrolled in PHC facilities should undergo at least one blood glucose test every month and eye funduscopy once annually. If the patient owns a glucometer, then conducting a glucose test in the polyclinic is not necessary; the results of glucometry may be recorded by his/her doctor in the patient's medical card. Diabetes patients who have an official disability status or belong to a socially vulnerable group are eligible to receive free hospital care.[23]

[ii] Each FAP is associated with a FP who is responsible for health care of certain village population. The FP is physically located in the village outpatient center of a bigger neighbor village and provides weekly visits to his/her adjunct village, where he/she provides consultation/care in the FAP building and performs home visits, if necessary.

There is no official guideline in Armenia for secondary level diabetes care.[iii] The only institution that can conduct monitoring of diabetes care is the MoH; however, there are no specific monitoring and evaluation mechanisms developed for diabetes care or specific tools to measure adherence to the existing standard/protocol for outpatient care.

Figure 1. The formal pathway of diabetes patients in the health care system.



*PHC endocrinologist recommends a referral and PHC GP writes the referral.

+ Every month a diabetes patient visit PHC GP and endocrinologist to get monthly dose of insulin and anti-diabetic drugs.

A study conducted in 2005 reported that only 52.9% of insulin-dependent diabetes patients in Yerevan were periodically testing blood glucose levels and only 8.6% urine glucose levels at home. The study report does not specify the frequency of check-ups. One third of the surveyed patients (32.4%) performed blood glucose self-monitoring when they felt bad. The main barriers for appropriate diabetes care included socio-economic conditions, time consumed to acquire insulin (especially for working and disabled persons), deficiencies in self-monitoring devices, lack of trust in doctors and insufficient knowledge about diabetes care. A qualitative study among diabetes patients' family members in 2007 confirmed that diabetes patients were not well informed about diabetes management, diabetes complications, and their prevention.[24] The majority of the family members suggested that health professionals did not provide enough information to diabetes patients about disease

[iii] This issue is further explored in the findings section.

management. Moreover, they suggested that lack of financial resources were also leading to poor patient compliance with treatment and appropriate diet.

4.4.1 Civil Society Contributions to Diabetes Care

Within the framework of the USAID supported Armenian Social Transition Project implemented in 1999-2003, the CHSR developed education materials for PHC providers and the general population. One of the modules covered Diabetes prevention.[25] The MoH and USAID approved those materials. The USAID supported Primary Health Care Reform (PHCR) project implemented in Armenia in 2005-2010 aimed to improve the primary health care system in Armenia.[26] One of the components of this project was public education, which aimed to improve health-seeking behavior though public health education and health promotion activities. The PHCR project organized a public education campaign, established Community Health Committees (CHCs), trained NGO representatives and journalists in prevention of common non-communicable (including diabetes) and communicable diseases and promotion of healthy behaviors.[26]

"Eraz" Charity Fund has provided support to diabetic children less than 18 years old donating glucometers and strips.

4.5 Human resources for diabetes care

Family physicians and endocrinologists are involved in diabetes care at the PHC level. Endocrinologists working in in-patient care facilities are responsible for secondary care. According to the MoH order N 131-A, the plannednumber of population served by a polyclinic endocrinologist is 30,000 (the minimum number is 20,000, the maximum-40,000).[27] Currently there are two endocrinology chairs in the Yerevan State Medical University that provide two-year residency training for endocrinologists. Family physicians who also receive two-year residency training take a module on diabetes care management. In Armenia, each physician (including endocrinologists) has to take a short training (for a fee) to receive 175 credits every five years within the framework of the continuous medical education. According to the Health Providers' Continuous Medical Education Plan 2011, endocrinologists and PHC physicians should undergo two-weeks training in diabetes (50 credits).[28]

According to the National Information Analytic Center, there were 220 endocrinologists in Armenia in 2010. About 80% of them (175) are located in Yerevan. The per capita distribution of endocrinologists is 0.7 per 10,000 population.[29, 30] There are 1,025 therapists in Armenia, about 65% of them (662) work in Yerevan; the per capita distribution of therapists is 3.0 per 10,000 population.[29, 30]

There are no nutritionists dealing with diabetes patients' care. Endocrinologists and PHC GPs or FPs usually consult diabetes patients on appropriate nutrition during their visits. The specialists that may deal with care of diabetes complications are either located in PHC facilities (such as cardiologists, neurologists) or in-patient facilities (where the range of these specialists is broader than in PHC facilities).

4.6 Procurement and distribution of drugs and consumables

A study conducted in 2005 about availability and accessibility of insulin and insulin supplies among insulin-dependent patients in Yerevan found that 68.6% of insulin-dependent diabetes patients had experienced interruptions in insulin administration due to insulin shortage in polyclinics or diabetic clinics because of lack of financing.[31]

According to Government decree N 1717, November 2006, drugs necessary for diabetes treatment (insulin and anti-diabetic drugs) officially should be provided for free to all diabetes patients by their PHC facility where they are enrolled. The Minister of Health order N74-N , January 2005, defines the mechanisms how these drugs should be provided to diabetes patients by PHC facilities (polyclinics[iv]) and dispensaries where they are officially registered as diabetes patients and by hospitals during in-patient care when needed.[32]

According to the same order N74-N, insulin and anti-diabetic drugs are purchased througha centralized procurement mechanism[v] and distributed to polyclinics, dispensaries and hospitals according toa distribution schedule approved by the Ministry of Health (MoH).[32] The MoH develops this distribution schedule based on reports from health care facilites on the number of diabetes patients and required doses of insulin and antidiabetic drugs. Polyclinics and dispensaries prescribe insulin and antidiabetic drugs and record in

[iv] For diabetes patients living in rural communities that receive primary health care from village outpatient centers, health centers or FAPs, insulin and anti-diabetic drugs are provided for free by their regional polyclinic.
[v] The National Purchasing Agency organizes centralized procurement based on the RA "Law on Purchasing", conducts an annual tender and selection of a company to import drugs into Armenia.

patients' medical cards or hospital medical forms.[32] The City Endocrine dispensary coordinates insulin and anti-diabetic drug distribution to Yerevan polyclinics and Social Support and Health Care Departments of Marzescoordinate this process in marzes.[21]

In polyclinics and dispensaries, diabetes patients receive insulin and anti-diabetic drugs from the pharmacy that is located in the facility or by a chief nurse. Polyclinics and dispensaries may also have contracts with their regional pharmacies that provide the drugs to their patients.[33] Each prescription, which is provided in duplicate, is writtenfor only one drug. One copy is stored in the polyclinic or dispensary and the other is given to the patient to pass it on to pharmacy to receive the drug. That copy of the presciption is stored at the pharmacy for five years. At the end of each month each pharmacy presents the number of insulin and anti-diabetic drugs prescribed to diabetic paitents to the PHC facility. Based on this information, the PHC facility develops the drug report and sends a copy to the State Health Agency (SHA) for accountability purposes.[32-34]

TheN74-N orderalso requires that in the case ofshortage or delays in the supply of drugs provided through the centralized procurement mechanism,including insulin and antidiabetic drugs, polyclinicscan be requested by MoH order to purchase these drugs on their own resources and provide to their patients for free.[32]

The Government does not provide syringes, glucomteres or their strips to diabetes patients. Some donors or humanitarian funds may occaisionnaly provide these items for free to diabetes patients.[35]

4.7 Financing of diabetes care

Since January 1, 2006, primary health care is free at the point of service for all citizens of Armenia;it is financed by the MoH budget on a capitation basis.[vi] Each year the Government allocates a budget for the centralized purchasing of insulin and anti-diabetic drugs out of the total health care budget. According to the MoH, about 2.2% of the total health budget was allocated for purchasing insulin and anti-diabetic drugs in 2011.[36, 37]

[vi]There is not a separate regulation specifically for diabetes care financing, different players engaged in diabetes care are financed within the framework of different standards and regulations. The research team tried to extract the information related to diabetes care.

Hospital inpatient care for general diabetes patients is not included in the Basic Benefit Package (BBP) covered by the MoH; this means they have to pay out of pocket for those services. However, according to the Government order # 318N and the Minister of Health order #712A, those diabetes patients, who are disabled or belong to a socially vulnerable group (defined in those orders) are eligible to receive free hospital care. In addition, the BBP fully covers hospital inpatient care for children 0-7 years old.[vii]

Outpatient and hospital health care financing standards (protocols) regulate reimbursement to the main health care providers for diabetes care (primary and secondary level endocrinologysts, primary health care GPs, FPs).[viii] Primary health care GPs, FPs and endocrinologysts in the polyclinics receive per capita based salary. MoH order N 131-A, February2011, determines the number of enrolled population and per capita payment rates for these providers.[27] According to this order, the planned size of served populatiom for a PHC physicianis 2,000 adult population, with the lowest number 1,000 and highest 2,500. Capitation based payment rate to PHC physiciansis about 4USD per adult individual registeredwith a slightly higher rate for mountaneous regions. The planned size of population served by polyclinic endocrinologysts is 30,000 with the lowest number 20,000 and the highest 40,000, and per patient payment rate isabout 0.2USD.[27, 38]

According to the Minister of Health order N 859-A, issued in May 2011, primary health care GPs and FPs are eligible to receive bonus payments for succesfullbest practices in eye funduscopy (administering eye funduscopy for a diabetes patietnt once a year) and availability/maintainance of electronic database of diabetes patients-dispansery patients registry (on the facility and PHC provider level).[39] The order regulates the bonus payment mechanisms according to these two performance indicators for PHC providers.[39]

The salaries of hospital endocrinologist and nurses in endocrine in-patient departments are calculated based on the general *Reimbursement Standards (protocols) of Employees of the Hospitals Providing State-Guaranteed Free Medical Care and Services*. The order of the

[vii]It was not possible to find information in trends of financial resources as well as out-of-pocket payments spent on diabetes care from official sources and existing reports. Some information about payments including out-of-pocket are covered in the results section.

Minister of Health N 101-A, 31 January 2011, amended by the orders N 314-A (25 February 2011) and N 613-A (06 April 2011), describe these standards(protocols).[40-42] These orders define the minimal base salary of hospital health providers 128USD[ix] for physicians and 103USD for nurses. The entire salary of a physician is the sum of the minimal base salary, officially determined rate for duties (night shifts), and bonus payment.[40-42]

4.8 Disability status

The Government Order N 276-N, March 2006, approved the protocol for Medical and Social Analysis for granting the disability status to eligible population.[43] The protocol defines that the regional Medical and Social Analysis committee, based on the eligible person's residency area (Yerevan or marzes), conducts the medical and social analysis for that person. The regional Medical and Social Analysis committees are the branches of the Medical and Social Analysis Agency established in 2002. The core staff consists of therapists, surgeons, neurologists and pediatricians; other specialists may be enrolled in case of a need for other professional expertise. The committee grants the disability status to an individual based on his/her medical records and provides 1st, 2nd, 3rd disability categories to the adult population and «child with disability" category to eligible children.[43] The list of conditions leading to disability are defined by the GoA decision N780-N in 2003 including «general disease" or "having the disease since childhood" and if the condition leads to consistent changes of body functions and deteriorates the individual's daily activities and social life.[44] This document does not contain anything directly related to diabetes; however, diabetes could be considered under "general disease" and diabetes Type I could be considered as "having the disease since childhood." The 1stdisability category is provided for two years, 2ndand 3rd categories for one year, "child with disability" category for two years or until 18 years of age.[44] The disability category may be provided lifelong if the condition is irreversible and cannot be rehabilitated.[43]

Diabetes patients with disability status are eligible to receive the disability pension along with other people with disabilities according to the accepted rules defined in the Law of the Republic of Armenia on the State Pensions, accepted in December 2010.[45] According to this Law, a person with a disability category is eligible to receive either disability labor pension if at the time of recognizing the disability he/she had at least two or more years of work

[ix] One US dollar is equal to almost 390 Armenian Dram (AMD), March 2012.

experience (the required years of service are different for different age categories), or military disability pension for military servants or disability social pension if the person is not qualified for the labor or military disability pensions or has been recognized as a "child with disability".[45] All types of disability pensions are provided to the eligible population for the period of disability. The calculations of these pensions are different - the labor and military disability pensions are calculated based on the years of work experience. The size of the disability social pension is calculated based on the disability category (1st, 2nd, 3rd categories) as defined in the Law: "1) 140% of the basic pension for persons belonging to the 1st category disability group and those recognized as a "child with disability"; 2) 120% of the basic pension for persons belonging to the 2nd category disability group; 3) 100% of the basic social pension for persons belonging to the 3rd category disability group."[45] Currently, the basic pension is about $33 according to the Government Order N 1860-N from December 29, 2011.[46]

The Law on Social Protection of People with disabilities from April 1994 clarifies that people with disabilities can work according to the individual rehabilitative schemes set by the Medical and Social Analysis Committee. They may work in regular work settings or in professional industries but the working conditions should not harm the health of the employed disabled person. For people with 1st and 2nd disability categories the working hours are reduced and should not exceed 36 hours weekly. In these cases the employees are reimbursed according to the actual working hours or the actual number of the product they produced.

5. Results

5.1 Inputs: Current Infrastructure and Resources for Diabetes Care

5.1.A Physical resources

5.1.A.1 Availability and physical conditions of facilities for diabetes care

We do not have adequate working [physical] *conditions…*

PHC endocrinologist 5.1.A.1.1
FGD, Shirak marz

The situation in marzes very poor. They [facilities] *do not have appropriate* [physical] *conditions, equipment and laboratory tests.*

Hospital endocrinologist 5.1.A.1.1
IDI, Yerevan

We need changes in everything here, starting from a [renovated or new] *building and*

everything else. We lack even the most basic things such as a toilet or running water. There's a small sink, but no running water.

PHC provider 5.1.A.1.1
IDI, Shirak marz

We don't have the necessary facilities. There is only a single room and we don't have anything [a shortage of sufficient supplies or equipment].

PHC provider 5.1.A.1.2
IDI, Shirak marz

Currently in our region we do not have a separate in-patient department where patients with complications can receive specialized treatment: if a patient has heart problems s/he receives treatment in a cardiology department, if retinopathy - in an ophthalmology department, etc. If I feel that a diabetes patient is in danger of ketoacidiosis, I send him/her to the general therapeutic in-patient care unit, where we have several beds for diabetes patients.

Policy maker/Expert 5.1.A.1.1
IDI, Shirak marz

Another thing that would be good to do in the management of diabetes is to have a department at the hospital with 5-10 beds, to have a small specialized center for diabetes patients in our marz, so our patients could receive treatment there and there would be no need to go to Yerevan.

Policy maker/Expert 5.1.A.1.2
IDI, Shirak marz

There is no in-patient pediatric endocrinology unit in Armenia. Adults are together with children in the hospitals. It is anti-sanitary… Children should not see how adults look after themselves… Everybody, including the Government, knows that there is no pediatric endocrinology in-patient unit in Armenia. They harm the children when bring together with adults in the same unit [the pediatric endocrinology in-patient unit was merged with the adult in-patient unit]. *The problem is that children with diabetes see people who lose their vision due to diabetes or adults with gangrenous limbs next to them in the same department…it is unbearable. When diabetic children see what adult patients eat, they tell us: "but you told us that we can't eat that."*

Policy maker/Expert 5.1.A.1.3
IDI, Yerevan

Physical conditions of facilities had problems particularly in the marz. Providers from Shirak marz and Yerevan reported that the physical conditions in marz facilities, particularly in rural areas, were not adequate and there was a need for improvements.

According to some policy makers/experts, there was no in-patient endocrinology department in Shirak marz, and diabetes patients who needed in-patient care were hospitalized in other departments or received care in Yerevan. Two policy maker/experts indicated that establishing a small in-patient endocrinology department in Shirak marz would help improve

hospital care for diabetes patients in Shirak marz and not require patients be referred to Yerevan.

One of the policy makers/experts noted that there was no paediatric in-patient endocrinology department in Armenia, and diabetic children received their hospital care with adult patients in the same in-patient endocrinology department.

5.1.A.2 Absence of diabetes foot-care specialized services and cabinets

There is no center for the treatment of diabetic foot complications. I have personally received training in Moscow, and for some reason they [the Ministry of Health] *didn't … open this cabinet at the Republican hospital.*

Policy maker/Expert 5.1.A.2.1
IDI, Yerevan

We have many cases of diabetic foot complications. This is a serious problem in our country. Serious actions are not being taken for diabetic foot care in our country.

Hospital endocrinologist 5.1.A.2.1
IDI, Yerevan

I heard that there are one-two doctors who deal with diabetic foot care, but we do not have specialized units for effective management [of this problem]. *We send our patients to other hospitals for diabetic foot complications, but very often they end up with amputations, since we do not have appropriate diabetic foot management services in our country.*

Hospital endocrinologist 5.1.A.2.2
IDI, Yerevan

I was taken to the Republican hospital, where 5-6 doctors checked my [patient with diabetes foot complications] *foot and discussed my problem with each other. Then an old doctor checked me and said that he would not touch a diabetic, because it is very dangerous and something could go wrong.*

Diabetes patients 5.1.A.2.1
FGD, Yerevan

It [the Armenian Association of Diabetic Foot] *was founded in December 2008 as an NGO; it has 5 members - all are surgeons. The main aim is to diagnose and treat diabetes patients with problems in their lower extremities, to prevent amputations and development of septicemia and other complications. Currently we* [the Armenian Association of Diabetic Foot*] function only with our own resources. We pay visits to different marzes - Syunik, Tavush, as well as Kharabakh. However, those visits are done once a year, during summer months, when we can take our vacation. During those visits we consult about 300 patients. Most of the treatments we provide are on-site. Probably only 10% of the patients continue treatment here in Yerevan. The organization of these visits is also done based on personal connections. During these visits we also deliver lectures to health care providers. We also organize an open day in Yerevan.*

Other specialist 5.1.A.2.1
IDI, Yerevan

Some of the policy makers/experts mentioned that there were no units in Armenia (ether at national or regional levels) specialised in care of diabetes foot complications.[x] If a diabetes patient had foot problems they were sent to surgical departments that very often did not provide appropriate care.

The Armenian Association of Diabetic Foot provides site visits in different marzes of Armenia, consult diabetes patients with foot problems and provide treatment. Unfortunately, these visits were not frequent and do not meet the existing need.

5.1.A. 3 Availability of drugs for diabetes patients

Coverage of insulin and anti-diabetic drugs

I can say that insulin is provided adequately and we do not have shortage or delays. Diabetes tablets cannot be provided to all diabetes patients, only 30% are covered due to lack of State financing.

If there is a shortage of insulin, it means that the facility head did not report the newly admitted cases since we allocate insulin according to their needs.

Policy maker/Expert 5.1.A.3.1
IDI, Yerevan

Insulin is more available than [anti-diabetic] *drugs.*

PHC provider 5.1.A.3.1
Shirak marz

Of course we can project how much [insulin] *we need for each patient and receive this amount, but when a patient uses a different dosage each day then you can't know in advance how much insulin they would actually need.*

PHC endocrinologist 5.1.A.3.1
FGD, Yerevan

… sometimes even if it is the amount that we requested, we run short at the end because we increase doses or identify new patients.

Policy maker/Expert 5.1.A.3.2
IDI, Yerevan

I buy insulin myself as there is a shortage of insulin at our polyclinic.

Diabetes patients 5.1.A.3.1
FGD, Yerevan

The insulin they give me lasts for only half a month; I buy the rest myself.

Diabetes patients 5.1.A.3.2

[x] There is no data on the number of the practicing physicians trained for diabetes foot or other compilations management.

FGD, Yerevan

We are unable to provide facilities with an adequate number of diabetes tablets since the State can provide only 30% coverage- so we provide each facility with only 20-30% of their reported needs for anti-diabetic drugs (tablets).

Policy maker/Expert 5.1.A.3.1
IDI Yerevan

They [polyclinics] *don't get enough* [anti-diabetic tablets] *for all. So we end up buying them ourselves.*

Diabetes patient 5.1.A.3.3
FGD, Yerevan

It is much better now [compared to ten years ago] *and it is gradually improving. First of all, there are various drugs* [anti-diabetic medicines] *to choose from, and there aren't as many deaths like we used to have back then.*

PHC endocrinologist 5.1.A.3.2,
FGD, Yerevan

It [diabetes care and drugs coverage] *was terrible in the previous decade. It is better now.*

PHC provider 5.1.A.3.2
FGD, Yerevan

Quality of drugs

The obvious improvement is that in the past we received animal insulin, while currently we receive only human insulin.

Hospital endocrinologist 5.1.A.3.1
FGD, Yerevan

During those years [in the Soviet time] *swine insulin was provided. Today we receive human insulin…*

Diabetes patient 5.1.A.3.4
FGD, Yerevan

Of course care and drug quality have improved; previously we had animal insulin, now we only have Humulins [a type of human insulin], *which reduces the possibility of complications.*

PHC provider 5.1.A.3.3
IDI, Shirak marz

Another problem is the quality of drugs that the government is purchasing. They are the cheapest available drugs in the market, which is also the result of insufficient funding.

Policy maker/Expert 5.1.A.3.3
IDI Yerevan

We have very good treatment schemes. But good treatment schemes need perfect medicine that are more expensive and cannot be provided for free on the state budget. Today diabetes patients receive insulin and anti-diabetic drugs from polyclinics. The drugs are obtained through a centralized procurement mechanism by the State, and are not as effective as compared to other brands [of insulin and anti-diabetic drugs] *that are more expensive and are not affordable for the State.*

Policy maker/Expert 5.1.A.3.4

IDI Yerevan

The quality of insulin provided by polyclinics is not always good.

Hospital endocrinologist 5.1.A.3.2
FGD, Yerevan

Availability of other drugs

Apart from hypoglycemic drugs, there are no other drugs available [provided for free] *for diabetics needed for the prevention of complications…*

PHC provider 5.1.A.3.3
FGD, Yerevan

The quantity of such medicines [drugs for diabetes complications] *is so limited in PHC facilities that it is hardly enough for patients with disabilities…, and cannot be provided to all diabetes patients.*

PHC provider 5.1.A.3.4
FGD, Yerevan

People receive only insulin and anti-diabetic drugs from polyclinics, no other drugs are provided for free.

Diabetes patient 5.1.A.3.6
FGD, Shirak marz

Patients with complications don't receive enough drugs [other than insulin and anti-diabetes drugs]. *Patients with a disability status are the only ones that may receive something…they can take whatever is available at the polyclinic at that moment.*

PHC provider 5.1.A.3.5
FGD, Yerevan

Currently, I take a drug for blood vessel health, with one ampoule costing 15-18USD, plus drugs for liver, vitamins, etc., so it averages to 90-128USD per month[out-of pocket].

Diabetes patient 5.1.A.3.7
FGD, Shirak marz

Almost all policy makers and experts claimed that the coverage of insulin was better (almost 100 %) than anti-diabetic drugs (tablets), at both national and regional levels. The low coverage of anti-diabetic drugs was due to lack of State funding that allowed purchasing only 20-30% of anti-diabetic drugs needed.

However, some policy makers/experts and health providers reported that sometimes they experienced shortage of insulin which was related to inability to project changes of dosage for insulin among patients and enrolment of new patients. A few diabetes patients confirmed that sometimes because of shortages of insulin they had to buy insulin on their own.

Almost all health care providers and diabetes patients highlighted that there was constant shortage of anti-diabetic drugs; existing supplies covered a small proportion of the need of patients for these drugs.

Nevertheless, most of health care providers and patients agreed that insulin and anti-diabetic drugs were relatively more available nowadays than ten years ago. The majority of study participants confirmed that the quality of insulin improved – only human insulin has been currently used in Armenia.

Some policy makers/experts and hospital endocrinologists reported that the quality of insulin provided for free (from the list of essential drugs) by the polyclinics was not as effective as other, more expensive insulin analogues that offer more balanced control of blood glucose levels[xi]. Given the limited budget, the better quality insulin was not feasible for the State to buy. Due to lower quality of insulin provided for free in polyclinics, some diabetes patients reported purchasing insulin from pharmacies or receiving it from their friends and relatives living abroad.

Almost all diabetes patients and some health providers stated that drugs to treat diabetes complications were not provided for free to diabetes patients. According to diabetes patients who participated in the study (both from Yerevan and Shirak), their monthly expenditures on these drugs ranged from 26-128USDand sometimes even more.

5.1.A.4 Availability of consumables

Glucometers and strips

One problem that we have in pediatric services is that the government does not provide supplies for self-monitoring. Glucometers and their strips are quite expensive and difficult for the parents to purchase… We are currently cooperating with a Foundation, which helps us with these issues [glucometers and strips]. *The fund was created because of these difficulties that we were facing*[lack of access to glucometers]*…However, due to limited funding they* [the Foundation]*can only help half of our patients; and so they provide around 200 children* [out of 350 diabetes children registered] *with a constant supply of strips.*

Policy maker/Expert 5.1.A.4.1
IDI, Yerevan

Diabetics all over the world have to monitor their blood glucose level a few times every

[xi] Recent studies suggest that insulin Detemir and insulin Aspart offer better glycemic control, particularly for type I diabetes patients.[51,52]

single day. Our patients won't do it regularly because buying strips is a huge financial burden to all of them.

PHC endocrinologist 5.1.A.4.1
FGD, Yerevan

Most of the patients rely on their relatives living abroad to provide them with glucometers and strips. …We always say buy glucometers [to a diabetic patient], *or ask a relative abroad to send their old glucometer to you as a cheaper option. … About 70% of the glucometers that our patients have are from abroad; basically other governments are supplying our patients.*

PHC endocrinologist 5.1.A.4.1
FGD, Yerevan

… My son bought one for me, so I started checking it myself. I buy the strips for the machine from the pharmacy, although it's extremely expensive. It used to be 10,000 AMD [26USD], *but now it's 14,000 AMD* [per 50 strips in a package, 36USD].

Diabetes patient 5.1.A.4.1
IDI, Shirak marz

The priest [from a local church] *helped me and gave me a glucometer; however, currently it is out-of-date and the strips are over.*

Diabetes patient 5.1.A.4.2
FGD, Yerevan

I have paid 22,000 AMD [56USD] *for one* [glucometer] *and then I had to go to the pharmacy and they asked me to pay 10,000 AMD* [26USD] *for the strips; there are only 50 in a pack. But I just can't afford paying that much money for strips all the time.*

Diabetes patient 5.1.A.4.3
FGD, Yerevan

We received a glucometer from USAID, however we are no longer able to use it, because we have run out of strips and pharmacies don't sell them [for this glucometer].

PHC provider 5.1.A.4.1
IDI Yerevan

Yes, I have my own dispensary office, as well as a glucometer, but I use it only in emergency cases because we do not receive the stripes regularly- so I have to ask our director to buy it.

Hospital endocrinologist 5.1.A.4.1
FGD, Shirak marz

I purchase the needles for my injector-pen, paying 70 AMD [0.2USD] *per needle. And of course since they don't provide the strips, I have to purchase those as well at 200 AMD* [0.5USD] *each.*

Diabetes patient 5.1.A.4.4
IDI, Yerevan

The price of strips is 5,000 AMD [13USD] *per package now (with 25 strips inside), and I use approximately 1.5 package monthly.*

Diabetes patient 5.1.A.4.5
IDI, Yerevan

We have purchased our own glucometers and strips, because it is absolutely essential. There are times that you just need to monitor the patient and see how they are…. We purchase those [strips] *with our own money because we need the strips to be able to carry out our job effectively.*

PHC endocrinologist 5.1.A.4.2
FGD, Yerevan

Syringes

We do not provide syringes or strips; the State does not have funds for that. Moreover, the syringes cost 30 AMD [0.1USD]*, so the polyclinics can purchase them with their own money and distribute them to the patients. From time to time we receive humanitarian aid which may include syringes or anti-diabetic drugs.*

Policy maker/Expert 5.1.A.4.2
IDI, Yerevan

I get syringes sometimes but very few. They are never enough for our patients.

PHC endocrinologist 5.1.A.4.3
FGD, Shirak marz

If we have any [syringes] *we give them to our patients, if not then they have to purchase some from pharmacies.*

PHC endocrinologist 5.1.A.4.4
FGD, Shirak marz

I use each syringe about 2-3 times.

Diabetes patient 5.1.A.4.4
IDI, Yerevan

The patients spend a lot of cash on syringes; each month I request 1,000 syringes along with the medication, but until today I've probably received only about 100 syringes. None of our patients use a single-use syringe only once; they inject with the same one many times until it becomes blunt.

PHC endocrinologist 5.1.A.4.1
FGD, Yerevan

Insulin-pen injectors

There was a time when we even had insulin-pens; however, they are over, and now we have insulin in ampoules again.

PHC provider 5.1.A.4.2
IDI, Shirak marz

Some time ago we received the pens which we distributed among our patients and then we ran out of cartridges and didn't receive new ones, so they couldn't be used.

PHC endocrinologist 5.1.A.4.1
FGD, Yerevan

But the cartidges[of insulin-injectors]*were not available anywhere, just the pen-injectors.*

Diabetes patient 5.1.A.4.6

FGD, Yerevan

To make peoples' lives easier, I personally would prefer to have those insulin-pens; injections done with those are painless.

Diabetes patient 5.1.A.4.7
IDI, Shirak marz

Insulin pumps

They [the Ministry of Health] *should provide at least children with pumps.*

PHC endocrinologist 5.1.A.4.5
FGD Shirak marz

Ideally, it would be very effective if the State and the Ministry of Health could provide free insulin pumps for type I diabetes patients (children, adolescents, and adult people with type I diabetes)... However, these pumps require a team work of several specialists- endocrinologists, engineers as well as patients - to be installed and managed appropriately. Insulin pumps are very expensive; each insulin pump costs US $6,000-10,000. This idea could be realized only with the support of the State and the Ministry of Health.

Policy maker/Expert 5.1.A.4.3
IDI, Yerevan

Almost all study participants mentioned that the State did not provide glucometers and their strips to diabetes patients (particularly adult diabetes patients), at both national and regional levels. Most of the patients needed to buy the glucometers and strips themselves, which were very expensive for them, or some received glucometers and strips from donor organization or their relatives living abroad.

Unlike adult diabetes patients, some children with diabetes received free glucometers with support from a donor organization; however, they were not able cover all children.

The majority of health care providers, particularly those working in polyclinics, reported that they were not provided with glucometers and strips. Some providers purchased their own glucometers from their own resources and had to buy the strips themselves for special emergencies.

PHC providers and endocrinologists reported that they rarely received syringes for distribution and in very limited numbers that could not cover the need of insulin dependent diabetes patients. Almost all diabetes patients confirmed that they did not receive syringes from PHC facilities and they had to buy the syringes themselves. Because of the costs, patients often reported using a single-use syringe multiple times.

Most of PHC providers and patients mentioned that there was a time when they (particularly type I patients) were provided with insulin pen-injectors, but the cartridges ran out and patients could no longer use the pen-injectors. A few PHC endocrinologists and a policy maker/expert suggested providing insulin-pumps to type I diabetes patients.

5.1.A.5 Availability of laboratory tests for diabetes management

Availability of laboratory tests

Today we have the opportunity to measure glycogentated hemoglobin, which is very important…but it is expensive and is not performed in polyclinics.

PHC provider 5.1.A.5.1
FGD, Shirak marz

C-Peptide test is also necessary for diabetes…but it is expensive and not feasible for primary health care facilities to conduct.

PHC provider 5.1.A.5.2
FGD, Shirak marz

We refer patients to take those tests [advanced lab tests] *in private labs, but they are not accessible for all* [diabetes patients].

PHC provider 5.1.A.5.3
FGD, Yerevan

Once every three months they have to have a glycogenated hemoglobin test. However, this test is carried out in a center [private medical center] *and costs 5,000 AMD* [13USD], *which is very expensive for our patients; therefore, most of them cannot afford it.*

Hospital endocrinologist 5.1.A.5.1
FGD, Shirak marz

Other examinations related to micro-macro-angiopathy are not accessible for all patients. It is very expensive [not performed in PHC laboratories].

PHC provider 5.1.A.5.4
FGD, Yerevan

It would be great to have glycogenated hemoglobin measuring equipment [in PHC facilities], *so that all patients would be able to take the test every three months.*

Policy maker/Expert 5.1.A.5.1
IDI, Yerevan

Quality of laboratory tests

It is intolerable when a parent takes his child's urine analysis for glucose examination when the child is already in coma, and the polyclinic provides very normal [glucose level] *results! They never actually conducted the test!*

Policy maker/Expert 5.1.A.5.2
IDI, Yerevan

I think that the reagents we get for analysis are of poor quality. Patient is providing blood for

testing in various laboratories and getting different results. I think this is due to different qualities of reagents because our laboratory doctor [who conducts the tests] *is very precise and qualified.*

PHC provider 5.1.A.5.6
FGD, Yerevan

The most important thing is that the analysis of glucose levels is not always precise. A patient goes to another laboratory and brings back completely different glucose level results…you feel so stupid! At least this [glucometry] *should be done correctly.*

PHC provider 5.1.A.5.7
FGD, Yerevan

They don't conduct the [glucose level] *testing correctly at the polyclinic unless you pay. I went to double check my glucose levels and I told them that I am diabetic and had checked at home and my glucose was high, so I needed accurate readings to understand what was going on. I paid 500 AMD* [1.3USD] *and they told me to wait for 10 minutes and they returned with my results in 10 minutes. Otherwise, they do not care and the test results are very inaccurate.*

Diabetes patient 5.1.A.5.1
FGD, Yerevan

Most of the health care providers noted that some advanced laboratory tests (glycogenated haemoglobin test, C-peptide, micro-macroalbuminuria tests) necessary for diabetes care were not conducted free-of-charge in polyclinics (neither nationally nor regionally), especially glycogenated haemoglobin test. Most diabetes patients reportedly could not afford these tests, which were not conducted in polyclinic labs.

Some PHC providers, diabetes patients and a policy maker/expert claimed that there was a problem with the quality of laboratory testing for glucose levels, particularly in polyclinics, which was associated with poor quality of reagents or the testing was poorly conducted.

5.1.A.6 Availability of medical equipment for diabetes care

We need to be able to conduct a Doppler examination [which is currently not available at their polyclinic].

PHC provider 5.1.A.6.1
FGD, Yerevan

We should have a Doppler examination room [at their polyclinic].

PHC endocrinologist 5.1.A.6.1
FGD Yerevan

The rest of the examinations that are necessary for the prevention of complications are not free. …Doppler examination costs 12,000-13,000 AMD [32USD]*… people cannot afford it.*

PHC provider 5.1.A.6.2

FGD, Yerevan

Of course it [Doppler test for eyes] *is a very expensive test.*

Hospital endocrinologist 5.1.A.6.1
FGD, Shriak marz

A few PHC providers and endocrinologists stated that there was no capacity for Doppler examination in PHC facilities and they had to refer these patients to private or hospital diagnostic departments for this expensive test.

5.1.A.7 Availability of diabetes registry and data collection

Strengths

We implemented a new[all out-patient visits] *database in PHC facilities to control the flow of PHC visits…GPs complete a special reporting 002 form for every patient that enters the PHC facility. If the patient undergoes lab procedures or visits a specialist, this information is also recorded by the GP on this form. Then PHC facility operators enter this information into computers, and we receive this information from PHC facilities electronically every three months. In this database (Out-patient Visits database) we can see each patient's flow, as well as data on every diabetes patient who is enrolled at a PHC facility, his/her visits, treatments received, and specialist consultations.*

Policy maker/Expert 5.1.A.7.1
IDI, Yerevan

We [doctors] *present our* [out-patient] *data to the Health and Social Support Department of Shirak marz, and they send it to the MoH. We do not have problems with reporting. Because of the computerized database the reporting is done effectively.*

Policy maker/Expert 5.1.A.7.2
IDI, Shirak marz

Data [out-patient] *are collected electronically from the health care facilities. There are three levels* [of data management]*: the PHC facilities, the marzpetaran* [the provincial government office], *and the State Health Agency; …Given that it is the first year of the program implementation, the data quality is not bad.*

Policy maker/ Expert 5.1.A.7.3
IDI, Yerevan

We only fill out the forms for the State Health Agency which provides financing, nothing more.

Hospital endocrinologist 5.1.A.7.1
IDI, Yerevan

We have a certain form that we fill after the discharge of every patient to show what tests and examinations have been carried out as well as the drugs the patient has received and then we submit it to our administration.

Hospital endocrinologist 5.1.A.7.2
IDI, Yerevan

Weaknesses

These 002 forms are too time-consuming to complete…it would be better to spend another 10 minutes with patients than spending time filling out these forms.

PHC provider 5.1.A.7.1
FGD, Yerevan

Instead of listening to the patient, you just automatically keep feeling out the [002] *form.*

PHC endocrinologist 5.1.A.7.1
FGD, Shirak marz

It is ridiculous; I fill out the [002] *form once, and then the GP does it for the second time. So there are two journals there* [at the polyclinic], *and there is another main journal.*

PHC endocrinologist 5.1.A.7.2
FGD, Shirak marz

Patients go to the specialists then return to us [GPs]. *We have to fill out the reporting* [002] *form, but sometimes it is very difficult and time consuming because we can't read their* [specialists'] *handwriting.*

PHC provider 5.1.A.7.2
FGD, Yerevan

The reporting is very time-consuming and requires a lot of writing. I don't understand why I have to collect the forms and complete them in the evening at home. I have no choice but to do that, because otherwise, I have to tell my patients to sit and wait so I can sit by the secretary to complete the form.

PHC endocrinologist 5.1.A.7.3
FGD, Yerevan

Sometimes we pay our secretaries extra so that they do it for us.

PHC endocrinologist 5.1.A.7.4
FGD, Yerevan

We have printed so many 002 forms since 2010, that we could have bought 4 computers instead…it is meaningless. Databases and networks are needed instead of this process to make our work easier and more effective.

PHC provider 5.1.A.7.3
FGD, Shriak marz

Although we [hospital] *have a registry, many patients who are monitored in other health facilities outside of the polyclinic are not registered at the polyclinic* [not integrated with the polyclinic data]. *It would be ideal if all physicians and endocrinologists, who work in the secondary level or in private clinics, could register diabetes patients in a single national registry* [central diabetes database].

Hospital endocrinologist 5.1.A.7.3
FGD, Yerevan

Although we have a diabetic registry, we do not know the number of diabetes related amputations, as the registry does not collect details regarding the types of diabetic complications.

Other specialist 5.1.A.7.1

IDI, Yerevan

According to the PHC providers, endocrinologists and some policy makers/experts, the PHC facilities reported the number of diabetes patients and information on their treatment through the special reporting form (both individual patient level and aggregate information). The State Health Agency received this information quarterly from Yerevan and marzes. This database was developed in 2010 to monitor the flow of outpatient visits in PHC facilities. However, all the PHC providers and endocrinologist complained about the time burden and redundancies in the process of filling out the 002 form.

Hospital endocrinologists indicated that they did report about out-patient visits of their diabetes patients and emphasized that diabetes complications were not specified in the reporting forms. Some participants suggested implementing an electronic database and network in every doctor's room to ensure effective and quick data collection without the paper work and creating a national registry that would include comprehensive data from hospitals, including detailed data on complications.

5.1.B Human resources

The number and distribution of endocrinologists

The number of specialists is sufficient. We have enough endocrinologists. I can even say that in Yerevan there are too many… To be honest they don't want to leave Yerevan and work in remote marzes, because the distance and salaries are not attractive… So, in some remote marzes we have a shortage of specialists, but not in Yerevan.

Policy maker/Expert 5.1.B.1
IDI, Yerevan

I do not think that we have a shortage of specialists since the out-migration rate is very high in our region, and currently specialists [endocrinologists] *are sufficient in numbers to serve the population in our region.*

Policy maker/Expert 5.1.B.2
IDI, Shirak marz

We don't have an endocrinologist at our polyclinic [in marzes]*…It is a problem, but we have an endocrinologist that comes from another hospital for insulin prescriptions.*

PHC provider 5.1.B.1
FGD, Shirak marz

Training of specialists

Pharmaceutical companies organize trainings for the specialists [endocrinologists], *and last year our department organized two seminars, which weren't for endocrinologists alone but for local doctors who work with diabetes patients. It was the University's initiative in*

cooperation with the mayor's office… we still see incorrect prescriptions and treatments from marzes without endocrinologists and I think that the only way to solve this will be making sure that there are endocrinologists everywhere.

Policy maker/Expert 5.1.B.3
IDI, Yerevan

In the Soviet era, specialists were sent for training to Moscow and St. Petersburg. Currently physicians from the rural polyclinics are not trained; a few use the internet for educational purposes. Pharmaceutical companies may sometime support doctors to attend conferences, but even then they finance the top doctors/experts and not those who really need it.

Hospital endocrinologist 5.1.B.1
IDI, Yerevan

Endocrinologists today come from a very strong professional educational background; we are constantly attending conferences, re-training and updating our knowledge. This has been going on for the last decade. Moreover, many organizations conduct trainings here, and our endocrinologists are very well trained and up-to-date.

Policy maker/Expert 5.1.B.4
IDI, Yerevan

I would suggest providing opportunities, particularly for us regional specialists, to participate in professional trainings abroad and to have more professional exchange programs for regional doctors. This will strengthen our professional skills.

Policy maker/Expert 5.1.B.2
IDI, Shirak marz

I remember one time USAID had organized very interesting training in polyclinics and marzes…very good training during which diabetes patients came for consultations and their cases were discussed.

PHC provider 5.1.B.2
FGD, Shirak marz

I remember we participated in a seminar once about the management of patients with diabetes and hypertension, but it was very basic.

PHC provider 5.1.B.1
FGD, Shirak marz

It would be better to organize something [training] *about diabetes complications also.*

PHC provider 5.1.B.3
FGD, Yerevan

We are doctors that work in a free-of-charge system [care is free in all primary health care facilities]*, but the training that is mandatory for us to undergo isn't free, and we have to pay for it. Now, for example, I have a salary of 34,000 AMD*[87USD] *per month because I work part-time and I have to pay 68,000 AMD* [174USD] *for the training session…If you don't have any other income from anywhere else, how can this possibly work?*

PHC endocrinologist 5.1.B.2
FGD, Yerevan

Availability of other specialists

Of course there is a need for other specialists [for management of diabetes complications]; *because whatever you do there are some limits for what GPs can do even if they are good.*

PHC provider 5.1.B.4
FGD, Shirak marz

…Then you have nephropathy among diabetics, which can be prevented and even slowed down, but our nephrologists don't understand much about diabetic nephropathy and the endocrinologists cannot intercede here because it is beyond their specialization. So, after a few years of dialysis, we end up with patients' severe complications.

PHC endocrinologist 5.1.B.1
FGD, Yerevan

Although we have ophthalmologists, we lack specialists dealing with retina problems; if there is a need for professional consultation for our diabetes patients, we refer them to Yerevan.

PHC provider 5.1.B.5
IDI, Shirak marz

Diabetes foot complications management

We take care of the patients [patients with diabetic foot complications] *ourselves, but if the patients come in with open, bleeding wounds, and then we send them to the surgeons.*

Policy maker/Expert 5.1.B.3
IDI, Yerevan

We do not have podologists [foot care specialists] *who would deal with diabetes patients' foot care... I have heard that there are one or two doctors* [surgeons] *who deal with diabetic foot complications, but we do not have specialized units for effective management. We send our patient to other hospitals for diabetic foot complications, but most end up with amputations.*

Hospital endocrinologist 5.1.B.1
IDI, Yerevan

… There are no specialists dealing with diabetic foot complications. Mainly vascular surgeons - however they do not distinguish between treatments and perform the same intervention both for ischemic foot and septic foot complications which should be radically different.

Other specialist 5.1.B.1
IDI, Yerevan

Once I was in a sanatorium and I burnt my foot in the bath because the sensations in my lower extremities were poor. The surgeon could not help me, but the traditional healer treated me. She gave me some ointments which were helpful.

Diabetes patient 5.1.B.1
FGD, Yerevan

Most of the participants reported that the number of endocrinologists is enough in the health system; however, their distribution between Yerevan and marzes was not appropriate: too many specialists in Yerevan and lack of specialists in marzes.

Almost all respondents agreed that continuous medical education (CME) for providers was very important. However, CME was not available or affordable for all the providers; some participants mentioned that available trainings were very basic and/or of low quality. Some participants indicated that trainings were often sponsored by pharmaceutical companies and directed towards top specialists; PHC providers and marz endocrinologists were often neglected.

Lack of other specialists who deal with diabetes complications was a concern for both health providers and patients, potentially leading to incorrect treatment and further complications. One of the major concerns was the lack of specialists to treat diabetic foot complications, leading to high rates of amputations. These concerns were reported to be true nationally and regionally.

5.1.C Financial resources

Financing is not sufficient. We have a small budget for diabetes management. I always negotiate… to increase the budget… I am responsible for my field [diabetes care] *and want to help first of all diabetes patients.*

Policy maker/Expert 5.1.C.1
IDI, Yerevan

It is necessary to have more funds for diabetes drugs. Every year we have a very small budget to purchase them. The number of patients increases, but the budget remains the same; so, we have to cover all patients' needs within the same budget. We cover insulin needs completely, but due to budget restrictions we cannot adequately cover the drug needs of diabetes patients.

Policy maker/Expert 5.1.C.2
IDI, Yerevan

In December 2010 we implemented a bonus reimbursement mechanism for PHC GPs and we also have ear-marked bonus reimbursements for diabetes: for GPs, the criteria for bonus payment includes completing successful eye funds examination among diabetes patients once a year and referrals to other specialists.

Policy maker/Expert 5.1.C.2
IDI, Yerevan

We [PHC GP] *are the weakest unit. We receive such low salaries that there is no motivation for us to improve our work, although we do…It would be good to increase the doctors' salaries.*

PHC provider 5.1.C.1
FGD, Yerevan

Doctors' [PHC GP] *salaries should be increased…*

PHC provider 5.1.C.2

Shirak marz

For example, if I [a PHC endocrinologist] *serve an area of thirty-something thousand population, I receive 50,000 AMD* [128USD]. *Even though I have the same amount of workload that, for example, my colleague does, she receives 100,000 AMD* [254USD] *because there are more people living in her area. This is not fair and poor way of paying specialists. I have made various requests and suggestions to the head of the polyclinic about setting a fixed salary that is more appropriate for a doctor, but there was no response.*

PHC endocrinologist 5.1.C.1
FGD, Yerevan

Almost all participants indicated that the State funding was not sufficient for effective management of diabetes in Armenia. They recommended increasing State funding for diabetes management to expand free access to diabetes care services(improving the coverage of free drugs, providing free consumables, and improving access for free diagnostic tests).

Two policy makers/experts explained that currently PHC providers received bonus payments for effective management of diabetes care. However, according to all PHC providers and endocrinologists, low salaries they received did not motivate them to improve the quality of diabetes care and suggested raising their salaries.

5.1.D Information resources

Guidelines for health care providers

We [PHC doctors] *have a protocol on how to manage hypertension, diabetes and coronary heart disease.*

PHC provider 5.1.D.1
FGD, Yerevan

It [the diabetes care guide] *is a guide for primary health care providers - GPs, there is nothing specifically for endocrinologists.*

PHC endocrinologist 5.1.D.1
FGD, Yerevan

We [endocrinologists] *have guidelines* [International Diabetes Federation guidelines on Diabetes care-not mandated by the MoH] *and …endocrinologists are aware of them and they perform their work following the treatment schemes in the guidelines.*

Policy maker/Expert 5.1.D.1
IDI, Yerevan

There is no universal guideline [for diabetes care for endocrinologists] *adapted for Armenia by our Ministry of Health; each clinic has its own way of treating diabetes patients... Diabetes management would be better supervised if these* [mandated] *protocols existed.*

Hospital endocrinologist 5.1.D.1
FGD, Yerevan

Of course we have guidelines and standards for family doctors. Now the guidelines for specialized health care providers [endocrinologists] *are in process and will be ready by the end of this year.*

Policy maker/Expert 5.1.D.2
IDI/ Yerevan

There are international guidelines developed by the International Diabetes Federation; however, every doctor has his/her approach to diabetes care. Yes …we have access to international guidelines and approaches; however, the providers of remote marzes are lacking access to these resources; they use knowledge which they acquired sometime in1860 [smiles].

Hospital endocrinologist 5.1.D.2
IDI, Yerevan

Diabetes patients' education

We organize educational sessions for diabetes patients and their parents; however, this is for hospitalized children only. But we do these on our initiative. There are no additional funds for these sessions; it would be much better if there were funds and someone who was paid and assigned to implement these activities.

Hospital endocrinologist 5.1.D.3
FGD, Yerevan

When the patients [diabetic children] *are identified, they are referred to Murat an hospital in Yerevan* [that deals with pediatric endocrinology] *where they are hospitalized and taught about diabetes during at least 2-3 sessions a week…All diabetic children participate in these sessions with their parents and learn everything that they need to know about diabetes care.*

Hospital endocrinologist 5.1.D.4
FGD, Shirak marz

Unfortunately, we [in marzes] *do not have patient education seminars or schools for diabetes patients, which would cover issues such as diet, hygiene, and care.*

Hospital endocrinologist 5.1.D.5
IDI, Shirak marz

We organize diabetes sessions here and we need financing for it… We organize our sessions for 10 patients. Our classes last an entire day, during which we organize lunch breaks for the participants. And we have two such sessions each month.

Policy maker/Expert 5.1.D.3
IDI, Yerevan

The population learns about diabetes from neighbors, relatives as well as the mass media.

Hospital endocrinologist 5.1.D.3
FGD, Yerevan

Diabetes patients read things related to diabetes from different sources. We [PHC GPs] *have no booklets to provide them with information, but we speak with them about it.*

PHC provider 5.1.D.2
FGD, Yerevan

We prepare leaflets for them [diabetes patients] *ourselves. I have made these leaflets adapted to our Armenian food… just giving the main idea of what you can or can't eat is enough for them to follow the diet.*

PHC endocrinologist 5.1.D.2
FGD, Yerevan

There are a few local and international organizations that help and educate the persons with diabetes in Armenia. They do little things, which do not reflect the real needs of diabetes patients.

Policy maker/Expert 5.1.D.1
IDI, Yerevan

The main problem is our population's lack of awareness and their mentality. You can't force them to do something. But if the patient is unwilling to take care of his/her health, then the doctor's work becomes useless.

Policy maker/Expert 5.1.D.2
IDI, Yerevan

Knowledge is very insufficient [among diabetes patients]. *They* [diabetes patients] *do not know or comprehend the seriousness of diabetes. Sometimes we explain these things to a patient many times, until they understand everything. Knowledge about diabetes is very poor.*

Hospital endocrinologist 5.1.D.2
IDI, Yerevan

When I was initially diagnosed I was given a special book for diabetics in the polyclinic.

Diabetes patient 5.1.D.1
FGD, Yerevan

It [information] *is also provided in the hospitals* [to diabetes patients]*; they write a diet… and give it to us… In my polyclinic the head gave me some good advice, as he was also a diabetic and an endocrinologist - I am walking four km per day.*

Diabetes patient 5.1.D.2
FGD, Yerevan

I only recently found out that diabetes is not a treatable disease. I had the disease for two years but everyone lied to me saying that my pancreatic gland had shut down and it would soon work again, if I maintained the diet, etc. Recently I talked to my friend, and she told me that it is not curable; I was under such stress…

Diabetes patient 5.1.D.3
FGD, Shirak marz

No, I didn't know anything [before diabetes diagnosis]. *Now I know everything, even more than doctors do. I fully understand what is going on with me.*

Diabetes patient 5.1.D.4
IDI, Shirak marz

I knew nothing about diabetes before I was diagnosed. None of my relatives had it and nobody from my circle of friends had it - so I knew nothing. Of course they speak about diabetes from morning till late night on television, but my doctor has been the main source of information for me. She gives every single detail about what you should eat or not, what you

should do and that you should be active. She tells us everything and she repeats it 10 times, just to make sure that we understand it all.

Diabetes patient 5.1.D.5
IDI, Shirak marz

My relative had type I diabetes; that was my first experience. After being diagnosed, I started reading a lot; I read many books and I use the internet. I have a clear understanding of what is going on. However, my doctors did not inform me much.

Diabetes patient 5.1.D.6
IDI, Yerevan

Nothing is understandable to us, because the information is extremely contradictory. You read one book, and it says honey is good for us [diabetes patients], *while the other says the opposite.*

Diabetes patient 5.1.D.1
FGD, Yerevan

According to almost all PHC providers, there was certain diabetes treatment guidelines designed for GPs. However, both PHC and hospital endocrinologists reported that there were no guidelines for endocrinologists approved by the Ministry of Health; some of them were currently using international guidelines available for endocrinologists for diabetes care.

Some policy makers/experts, hospital and PHC endocrinologists mentioned about special diabetes training sessions for diabetes patients, primarily for children having diabetes type I. However, these educational sessions were mainly providers' initiative and involved small groups of patients and parents. The Government did not allocate specific funds for these trainings or diabetes schools in Armenia.

The results suggested that awareness of diabetes in the general public, including many patients, was not very high in Yerevan and marzes. Diabetes patients listed very different sources of information on diabetes.

5.1.E Social resources

Benefits for diabetes patients

We [the State] *do not have special services for patients with diabetes-related disabilities, but there are other international and local organizations that support these people* [diabetics] *and we try to support them as much as we can.*

Policy maker/Expert 5.1.E.1
IDI, Shirak marz

If only they [the government] *would help with something, we* [diabetes patients]*could also*

contribute and then we would be far better off, but they[the government] *have left everything to us*[diabetes patients] *and we are unable to get everything done alone…my benefits aren't enough to adequately support my care … So, what am I supposed to do? Pay for food or medication? They* [the government] *don't help in any way.*

Diabetes patient 5.1.E.1
IDI, Shirak marz

We don't have any other assistance apart from the pension[for those with disability status] *we receive, and for that we have to go to the committee* [Professional-Medical Commission] *every single year to get the disability status extended.*

Diabetes patient 5.1.E.2
IDI, Yerevan

Diabetics should be given a lifelong disability status. If I knew that I would recover [from diabetes] *I wouldn't even take the pension…but it isn't the case.*

Diabetes patient 5.1.E.3
FGD, Shirak marz

As special support for such people [meaning diabetics], *the only thing is the free of charge hospital treatment for those who have a disability status.*

PHC provider 5.1.E.1
FGD, Yerevan

…one of the most urgent needs is the availability of special shoes for diabetics with foot problems. In Sweden and the USA the government pays for this service because it is very expensive…I have even suggested establishing a small company [producing shoes for diabetics] *here to handle these problems.*

Policy maker/Expert 5.1.E.2
IDI, Yerevan

The patients with diabetes need special care - massages, rehabilitative care. Many years ago there were tickets to visit sanatoriums once a year, but now there is nothing.

Diabetes patient 5.1.E.4
FGD, Shirak marz

Sports facilities are expensive and diabetic patients cannot afford to visit these facilities…

PHC provider 5.1.E.2
FGD, Yerevan

Getting a disability status for diabetes patients

I need hospital in-patient treatment to get a disability status, but it [hospital care] *costs and I can't afford it… One doctor from a different polyclinic even suggested the price for it* [for an unofficial payment for acquiring a disability status from the Professional Medical-committee].

Diabetes patient 5.1.E.5
FGD, Yerevan

My husband has had diabetes for seven years. He already has visual problems, and is inoperable, but we can't get a disability status. They [Professional-Medical Committee] *ask you to pay* [informal payment] *and if you don't, they don't give you a disability status.*

Diabetes patient 5.1.E.3
FGD, Shirak marz

And to be quite honest with you, it is very unpleasant for me that I have to see these people [Professional-Medical Committee] *every single year; they aren't nice to us at all. They refuse to give me a lifelong disability status.*

Diabetes patient 5.1.E.2
IDI, Yerevan

In the past everybody who had type I diabetes would automatically be considered handicapped and receive aid from the government, but now they won't even assign the lowest disability grade to a type I diabetes patient.

PHC endocrinologist 5.1.E.1
FGD, Yerevan

There were no State-supported social benefits specifically for diabetes patients. They could receive State benefits only after getting an official disability status, but many diabetes patients from Yerevan and Shirak marz indicated that it was difficult to get and maintain a disability status without informal payments. All diabetes patients suggested that they needed more social support.

5.2 Mechanisms/Processes: Patient Pathways to Diabetes Care

5.2.A Diagnosis pathway

Diabetes symptoms for seeking care and diagnostic pathways

I've always drank a lot of water, which was why I didn't notice a difference in my health. Eventually, the numbness in my fingers and feet was what made us think something was wrong. My child said that we should go and test my glucose. We went for a test [at the polyclinic] *and she came home completely pale. I thought that I must have some horrible disease, and she said that I had diabetes with a glucose level of 20.5* [mmol/l].

Diabetes patient 5.2.A.1
FGD, Yerevan

It [diabetes] *began with my teeth. All of my teeth fell out, and I lost a tremendous amount of weight - about 25 kg - I became as thin as a matchstick. To be honest, after those symptoms started, I postponed my visit to the health care provider. I didn't want to believe that I may be diabetic. I went to Leninakan* [now Gyumri] *polyclinic for a check-up only after one year and they found that I had a high glucose level.*

Diabetes patient 5.2.A.2
IDI, Shirak marz

I was ill for one month. In the beginning I had flu and then with the flu I got dry mouth; I was very thirsty at the time - I had a fever and felt fatigued. We initially thought that it was due to the flu but then we realized that it was not the flu, but we didn't know what it was. When I went into coma my parents called an ambulance. They [ambulance] *didn't understand what was wrong; so, they took me to the hospital.*

Diabetes patient 5.2.A.3
IDI, Yerevan

I lost weight and drank a lot [water]*, however I didn't suspect diabetes. Then one day I fell into a coma and was hospitalized at the intensive care unit where I stayed for one week and was diagnosed with type I diabetes.*

Diabetes patient 5.2.A.4
FGD, Yerevan

I realized I was diabetic after I tested my blood at my neighbor's house using their glucometer.

Diabetes patient 5.2.A.5
FGD, Yerevan

The adult population first comes to the polyclinic. Based on the patient's complaints, the district GP tests them for blood glucose levels and refers them to the [PHC] *endocrinologist for diagnosis.*

Hospital endocrinologist 5.2.A.1
FGD, Shirak marz

Actually there are two systems that work here; in the first instance the patient has complaints and goes to the polyclinic endocrinologist or the GP because the service is free. This is true also for children, especially in the marzes, because there may be some differences in Yerevan and people may go to doctors they already know, but marz residents rely on the free services. And I believe that this system works and probably about 80% of diagnosed diabetics are identified through this route. The rest of the patients go to a familiar doctor in Yerevan; it happens very often that relatives of our patients who are from marzes come to see us [at the hospital in Yerevan].

Policy maker/ Expert 5.2.A.1
IDI, Yerevan

Usually such patients have different health problems- such as itches in their genitalia particularly in women and urethritis in men. They visit different doctors- gynecologists, urologists, etc. and if a doctor is a good professional he/she asks the patient to take a blood glucose laboratory test, which helps in the diagnosis of diabetes. Then they might visit their PHC GP for consultation, who sends them to an endocrinologist for diagnostic confirmation.

Hospital endocrinologist 5.2.A.2
IDI, Yerevan

Patients either know more about it [diabetes] *because they have a family member with diabetes, so they seek out diagnostic test, or he/she is brought to the hospital when he/she is already in coma.*

Policy maker/Expert 5.2.A.2
IDI, Yerevan

Patients come to the polyclinic…It is very uncommon for patients to have tested their glucose with strips or had a glucose test done at another facility and come with already knowing their glucose level …

PHC provider 5.2.A.1
Shirak marz

Usually they learn that they have diabetes without planning to have a test while visiting relatives or neighbors. Somebody just checks their glucose and then decide to randomly test others in the room.

PHC endocrinologist 5.2.A.1
FGD, Shirak marz

Payments for diabetes diagnosis

I didn't pay anything and they [PHC doctor] *examined me thoroughly.*

Diabetes patient 5.2.A.2
IDI, Shirak marz

It [the test for blood glucose level] *costs 1,000 drams in the polyclinic* [informal payment]...

Diabetes patient 5.2.A.6
FGD, Shirak marz

One of them [laboratory technicians] *asked me if I would like to get the results quicker and I said no. She was surprised at my response. I told her that I was not in a hurry, and that I would come back next day to get the results. Why would I want to pay an additional 1,000 AMD* [informal payment, 3USD]*?*

Diabetes patient 5.2.A.7
FGD, Yerevan

It's 1,000 AMD [informal payment, 3USD] *to get the* [blood glucose level test] *results right away* [in a polyclinic].

Diabetes patient 5.2.A.5
FGD, Yerevan

Almost all type II diabetes patients (in Yerevan and Shirak marz)emphasized that they had some symptoms, which made them to see a doctor for diagnosis at health facility (either their local PHC facility or private clinics); a few patients learned about their disease accidentally. The majority of type I diabetes patients were diagnosed in their younger age and sometimes were first diagnosed after going into coma and being admitted to hospitals. Policy makers/experts and providers confirmed these findings.

Although services in polyclinics were free, some patients reported making informal payment to receive their lab results more quickly. This was true for both Yerevan and marzes.[xii]

5.2.B Diabetes screening programs

Absence of any screening programs

[xii]For many of the patients the actual pathway was the same as the formal one. For those who were different from the formal pathway, actual pathways vary significantly from case to case and it would be difficult to summarize those pathways.

Nothing is being done for early detection of diabetes…if the patient goes to the GP for something and their blood glucose is high, they may be sent over to us [polyclinic endocrinologist] *for testing. Otherwise, nothing is being done on a mandatory basis.*

PHC endocrinologist 5.2.B.1
FGD, Yerevan

They [patients] *visit for preventive services, but glucometry is not done for all patients- it is not a screening procedure. It is performed only if there is some complaint, anamnesis, risk factors, other diseases, etc…*

PHC provider 5.2.B.1.
FGD, Shirak marz

…we have a rule, that every person who visits the polyclinic for any health problem should undergo blood glucose level testing, regardless of his/her health complaints. This is true only for those who come to the polyclinic. We do not conduct a global screening for diabetes. It is not feasible.

Policy maker/Expert 5.2.B.1
IDI, Shirak marz

…according to the protocol the blood glucose level is measured at the beginning of pregnancy and during the 24thweek. This procedure is conducted in our maternity clinics… but since this is expensive it isn't carried out in 100% of the cases.
…As I said there is no screening for diabetes in Armenia. However, since glycogenated hemoglobin has been globally accepted as a diagnostic method, they're [The Ministry of Health] *thinking about using this method for screening as well…*

Policy maker /Expert 5.2.B.2
IDI, Yerevan

Diabetes screening during the Soviet period

It was in the Soviet times, when employed people underwent regular medical check-ups in their workplace and their blood glucose level was checked regularly.

Policy maker/Expert 5.2.B.1
IDI, Shirak marz

If we are comparing times before the Soviet system collapsed and now, then in some aspects it was better. For example, diabetes screening was performed systematically and regularly in all work places for the entire population…

Policy maker/Expert 5.2.B.3
IDI, Yerevan

In 1984-85, during the Soviet period there was a law that every patient that stepped into the hospital had to undergo a mandatory checkup which included blood-work, screening, everything. It did not matter what they were there for …

PHC endocrinologist 5.2.B.2
FGD, Shirak marz

Suggestions for diabetes screening

It would be wonderful if we could screen the entire population at risk, especially since diabetes type II is connected to weight gain and is a metabolic syndrome. At first, we could test those from higher risk groups, but then expand to the entire population. It would be easier

to do this at the first place of contact for health problems which is usually the polyclinic…
Policy maker/Expert 5.2.B.4
IDI, Yerevan

We have proposed a new screening program [for diabetes] *to the Ministry of Health for implementation next year, and it is in the process of approval. I hope in the near future we will have a screening program for the general population. People will undergo diabetes screening check-ups once a year.*
Policy maker/Expert 5.2.B.3
IDI, Yerevan

It would be good if some diabetes screening programs were implemented, because we deal primarily with patients who have already had diabetes for 2-3 years.
Hospital endocrinologist 5.2.B.1
FGD, Yerevan

In order to prevent diabetes, screenings should be conducted for everyone who is older than 40 years of age.
PHC provider 5.2.B.2
FGD, Yerevan

The majority of experts and providers noted that glucometry was conducted at polyclinics either for risk groups such as pregnant women, or based on patients' complaints. Participants reported that currently there was no screening program for diabetes. Many providers proposed implementing mandatory diabetes screening program for early detection. They suggested initiating diabetes screening first among high risk populations, then expanding to the entire population. This suggestion is in line with the National Diabetes Strategy. However, some policy makers/experts felt that diabetes screening was too expensive and not feasible for Armenia.

5.2.C Treatment pathway

5.2.C.1 Treatment pathway after diagnosis

As soon as I learned that I have diabetes, I went to the polyclinic next day.
Diabetes patient 5.2.C.1.1
FGD, Yerevan

After being diagnosed, I received care at our medical post and at the Akhuryan polyclinic [regional polyclinic]. *At first, they prescribed tablets, but the glucose level increased a lot and they changed it to insulin. For the last three years I have been using insulin.*
Diabetes patient 5.2.C.1.2
IDI, Shirak marz

At first our villagers are examined by us, and then if we find it necessary for further examination, we send them to the village ambulatory. The doctor visits us here and if we

discover a person with diabetes, she monitors the patient. In addition, examinations are also conducted at the Akhuryan polyclinic [Shirak marz].

PHC provider 5.2.C.1.1
IDI, Shirak marz

They [local GPs] *send the patients to me. I prescribe the medication, and they conduct monitoring and management. I continue to consult the patients...*

PHC endocrinologist 5.2.C.1.1
FGD, Shirak marz

Once diabetes is diagnosed, the patient is referred to the [PHC] *endocrinologist for further care or the GP who is engaged in diabetes care* [if the facility does not have an endocrinologist].

Policy maker/Expert 5.2.C.1.1
IDI, Shirak marz

There are also some patients with a diagnosis of diabetes who do not even visit doctor for care and start treatment on their own- let's say, by their neighbors' advice…

Hospital endocrinologist 5.2.C.1.1
FGD, Yerevan

Then they might visit their PHC facility GP for a consultation, which in turn sends them to the endocrinologist for confirmation and consultation. There might be people who do not apply to the PHC level, but directly to a hospital endocrinologist, since it is their choice. However, if the patient wants to receive free of charge medicine he/she must be registered with the PHC level GP and endocrinologist, since the drugs are provided to diabetes patients by PHC facilities. There are patients who prefer to buy their diabetes drugs themselves, and do not apply and get registered at the PHC level. So, there is no single approach for seeking care. We also have patients who do not apply to a doctor after being diagnosed with diabetes. They prefer self-medication such as diets, herbal therapy, or learn about the drug that their diabetic neighbor or relative uses and use that drug without doctor's consultation.

Hospital endocrinologist 5.2.C.1.2
IDI, Yerevan

I was treated at the hospital [after being diagnosed with diabetes]. *There is no treatment for diabetes; they just keep an eye on you. So they prescribed the medication at the hospital and I am still using the same thing.*

Diabetes patient 5.2.C.1.4
IDI, Yerevan

I was hospitalized for 15 days, after which I was referred to the "Arbes" center which belonged to the Arabkir polyclinic [Yerevan], *where I was registered until I turned 18. I visited each month, receiving my medication and syringes. My treatment was not changed. I started insulin and I continue to use it.*

Diabetes patient 5.2.C.1.5
IDI, Yerevan

After diabetes diagnosis is confirmed, people are registered with the endocrinologist at their district polyclinic and receive their drugs from there. In severe cases, polyclinic endocrinologists refer patients to the hospital. At the hospital we check the glucose level

hourly to find the optimal dose of insulin for the patient. After discharging the patients, they return to their polyclinic endocrinologists with their treatment schedules of insulin.

Hospital endocrinologist 5.2.C.1.3
IDI, Yerevan

There are some people who come to us[private medical center] *instead of the public sector; I have asked them why they didn't go to their local polyclinic, and they have responded that it's because everything is free-of-charge and therefore of low quality. It's like shopping; some go to the cheaper stores, while others prefer the expensive places since they are convinced that it's better quality. So, now it's the same issue with medical services; they have the right to choose.*

Hospital endocrinologist 5.2.C.1.4
FGD, Shirak marz

Almost all participants agreed that the patients visited their polyclinic GP and endocrinologist after being diagnosed with diabetes for consultation and care. There were patients who received their first care in hospitals since they were hospitalised either in coma or with other health complications. A few patients approached private endocrinologists after being diagnosed with diabetes because they considered the quality of care better than the free services in polyclinics.

Once diabetes diagnosis was confirmed, GPs often referred the patients to the PHC endocrinologist for further consultation and care. Many participants indicated that patients primarily visit polyclinics to receive free insulin and anti-diabetic drugs. Some patients interrupted their treatment because of different problems. Sometimes those patients who could afford buying medicine from pharmacies avoided visiting polyclinics.

5.2. C.2 Changes of treatment pathway

My treatment didn't change at the hospital. The quantity of insulin I receive changed from when I was a child, but the whole treatment is the same.

Diabetes patient 5.2.C.2.1
IDI, Yerevan

…in Yerevan at first, the professor [endocrinologist] *prescribed tablets; however, afterwards he switched to insulin, as the tablets didn't work. That was the only time I visited a doctor in Yerevan. I continued my care in our district polyclinic. The endocrinologist from the polyclinic increased the dose of insulin.*

Diabetes patient 5.2.C.2.2
FGD, Shirak marz

The vast majority [of diabetes patients], *about 85-90%, continues treatment here* [PHC facility].

PHC provider 5.2.C.2.1
Shirak marz

They [diabetes patients] *may come to us and receive medication and then go receive care from another place as well.*

PHC endocrinologist 5.2.C.2.1
FGD, Yerevan

If they [diabetes patients] *are leaving to register with another polyclinic, we know because we have documentation, which is stamped and provided in triplicate and if they are not in the polyclinic anymore then they are removed from the computer database as well.*

PHC endocrinologist 5.2.C.2.2
FGD, Yerevan

Since my son is a military officer, I went to the army hospital. They have a very good endocrinologist there, who prescribed Diabetes and Glucafage [anti-diabetic drugs]. *However, the endocrinologist was relocated elsewhere, since he was an army doctor. So, I went to the Diabetes center and the doctor from there suggested going to my local polyclinic.*

Diabetes patient 5.2.C.2.3
FGD, Yerevan

At first they sent me to Akhuryan hospital [regional hospital] *to see the endocrinologist. I went there and the doctor examined me...She prescribed some tablets and I took those tablets for 10 years. They switched me to insulin a few years ago. I have had diabetes for 20 years.*

Diabetes patient 5.2.C.2.4
IDI, Yerevan

I am monitored here in Yerevan. By the doctor's advice, I first started with Diabeton [anti-diabetic drug], *then after developing a stroke in 2008, I switched to insulin. Now I receive insulin only.*

Diabetes patient 5.2.C.2.5
FGD, Yerevan

I went to the diabetic center... So, the doctor registered me and they began my treatment course. This was about 12-13 years ago. Afterwards, I had to quit my job because I am unable to walk, and my husband is in an even worse state than I am; therefore, none of us could go to the center to receive my medication any longer. But nobody called to see what was wrong with me [interrupted treatment]. *… So, I found my old doctor from the army hospital and asked for his advice. He told me to take two Glucavance in the morning and evening and Diabeton during daytime. I've been doing exactly that for 2 years now and I don't even control it. I have developed a special technique for myself; I am my own doctor, I control myself.*

Diabetes patient 5.2.C.2.3
FGD, Yerevan

Some patients reportedly changed their primary diabetes caregivers, mainly because of lack of satisfaction with the providers, and health care facilities during their treatment history,

while reportedly most remained with the same endocrinologist. Some patients reportedly progressed from anti-diabetic drugs to insulin over time. And some patients preferred self-treatment (such as herbal therapy, some anti-diabetic drugs without doctor's prescription based on their relatives/friends advice etc.) because of either lack of knowledge about diabetes management or lack of trust towards health providers.

5.2.C.3 Current monitoring of diabetes patients

Visits to health care providers

I am registered at our local polyclinic at present where I have my own doctor who is an endocrinologist, I think. I already know that I need to be monitored; so, I usually go on my own initiative. However, they also call every once in a while. I am a student and can't go each month, so my parents go when I can't.

Diabetes patient 5.2.C.3.1
FGD, Yerevan

I go each month for my medication and of course they [from polyclinic] *call me each year for the disability status registration.*

Diabetes patient 5.2.C.3.2
FGD, Yerevan

I undergo examination (urine, blood tests etc…) twice a year regularly by my private doctor's request or by myself; I read a lot and know what tests I need.

Diabetes patient 5.2.C.3.3
IDI, Yerevan

The frequency of attendance [to health providers] *depends on the age of the patient, the presence of complications, as well as their intellectual capacities.*

Hospital endocrinologist 5.2.C.3.1
FGD, Yerevan

They're [polyclinic endocrinologist] *very attentive. You can go see them and pose questions for hours and they will spend time with you and carefully respond to all of your questions. The same goes for the village outpatient center doctor. I am very grateful to all of them. I can go to them whenever I want to, but they do urge us to visit often. They always say that we should go at least once every 10-15 days, and we should not be late. They test us at least once a month. They call us and persuade us to go for our check-ups.*

Diabetes patient 5.2.C.3.4
IDI, Shirak marz

Weave contact with all of them [diabetes patients] *and they are aware of everything* [related to diabetes care].

PHC provider 5.2.C.3.1
IDI, Shirak marz

The diabetes patient is an individual. Some are careful and see their endocrinologist regularly to take care of their health; others don't and do not make regular visits to their doctors.

Hospital endocrinologist 5.2.C.3.2
IDI, Yerevan

Diabetic patients come to a polyclinic once every 15 days…to get their medicine.
PHC provider 5.2.C.3.2
FGD, Yerevan

Nobody asks us [diabetes patients] *to come to the health facility; we visit whenever we feel bad.*
Diabetes patient 5.2.C.3.5
FGD, Yerevan

To get medicine from the polyclinic we visit the polyclinic once every month. If we don't feel well or have some other health problems, we go more often.
Diabetes patient 5.2.C.3.6
FGD, Shirak marz

Once every month, maybe once every two months, I go to the polyclinic. Sometimes she [the polyclinic endocrinologist] *calls, but I don't go. Usually we take a referral from the village outpatient center and go to Akhuryan* [the regional polyclinic] *to see our endocrinologist.*
Diabetes patient 5.2.C.3.7
FGD, Shirak marz

Previously, I went there [polyclinic] *more frequently, but now I visit the polyclinic mainly for drugs.*
Diabetes patient 5.2.C.3.8
FGD, Shirak marz

The role of health providers in diabetes care monitoring

Based on the test results, we refer diabetes patient to the endocrinologist. After that, the endocrinologist and I see the patient. A diabetes patient cannot go to the endocrinologist without our referral.
PHC provider 5.2.C.3.3
FGD, Yerevan

We perform glucometry and consult with the patient once a month and more often in complicated cases. Those patients who are not on insulin-therapy are mainly monitored by GPs. Those who are on insulin-therapy are monitored both by GPs and endocrinologists from the polyclinic.
PHC provider 5.2.C.3.4
Shirak marz

I never visit her [GP], *even though she knows about my diabetes. Therefore, she doesn't play any role in my diabetes control.*
Diabetes patient 5.2.C.3.3
IDI, Yerevan

She [GP] *monitors mean I always contact her whenever I feel bad. She does her best. Moreover, she does glucose measurements, controls the dosage of my drugs, and examines me when necessary.*

Diabetes patient 5.2.C.3.9
IDI, Shirak marz

The doctors at the village outpatient center are very good. They are very attentive. They even come and visit me at home. The village nurses are also very nice and attentive. A single call or a slightest whisper and they're already here standing by my side. I really appreciate all of them and I am very thankful.

Diabetes patient 5.2.C.3.4
IDI, Shirak marz

None of us [diabetes patients] *are pleased with the polyclinic services. The only thing that the GPs are interested in is money and they don't help us.*

Diabetes patient 5.2.C.3.10
FGD, Yerevan

If we have diabetes, we are under supervision of the endocrinologist, not the family physician. Family physicians only document the treatment, whereas endocrinologists manage drug dosages…

Diabetes patient 5.2.C.3.11
FGD, Shirak marz

There was an endocrinologist in our polyclinic some years ago, but now she's gone and we only have a GP who does not understand anything about diabetes care and only fills out the forms.

Diabetes patients 5.2.C.3.12
FGD, Yerevan

Monitoring of blood glucose level

Most often the GP measures my glucose level at the village outpatient center. I also check my glucose level at home; I have a glucometer and my daughter-in-law checks my blood glucose level whenever I feel bad.

Diabetes patient 5.2.C.3.9
IDI, Shirak marz

I measure it [the blood glucose level] *at home twice-a-day every single day, and regulate my insulin intake according to the results. I know that some people just inject without measuring their glucose but that is wrong and it shouldn't be done that way.*

Diabetes patient 5.2.C.3.13
IDI, Yerevan

I have a glucometer too, but I don't measure my glucose every day not to be anxious about high glucose levels. I just know if something is wrong based on how I feel. Some check it if I feel bad.

Diabetes patient 5.2.C.3.14
IDI, Yerevan

All our patients have glucometers at home. They all know how to check their blood glucose level and check it regularly. There is an accepted standard[protocols] *that the doctor can rely on the patient's measurements of his/her blood glucose level by glucometer and can register these numbers in his/her medical card during the subsequent visit. According to the*

accepted standard [protocols], *the doctor may ask the patient to have a blood glucose check-up in the PHC laboratory once a year.*

Policy maker/ Expert 5.2.C.3.1
IDI, Shirak marz

I have a glucometer at home and when I feel bad or drink a lot of water I test my glucose approximately once every three days…

Diabetes patient 5.2.C.3.15
FGD, Shirak marz

I have a glucometer but I don't trust it. It measures glucose incorrectly. It often shows results that are double the actual number. So, I go to the polyclinic to get accurate measurements.

Diabetes patient 5.2.C.3.16
FGD, Yerevan

We don't check our glucose every day because the strips are very expensive. It costs us 300-400 drams per strip. We can't afford it. We measure it whenever we feel bad.

Diabetes patient 5.2.C.3.17
FGD, Shirak marz

They [the State] *don't provide us with any strips and we can't afford to buy them from the pharmacy, so even those of us who have the glucometer aren't able to measure our glucose.*

Diabetes patient 5.2.C.3.10
FGD, Yerevan

When I learn that my glucose level is very high I become anxious and feel worse. For that reason I don't test it every day. It is better not to know about high glucose level than know and worry about it.

Diabetes patient 5.2.C.3.6
FGD, Shirak marz

Most of the patients reported regularly visiting their diabetes caregivers once or twice a month: health providers confirmed this information. Some patients reported visiting health providers only in case of feeling bad (such as headache, fatigue, dizziness, etc.). In some cases patients reported that their polyclinic endocrinologist called them to follow up.

According to the majority of diabetes patients, the role of their GP in their diabetes monitoring was secondary to the endocrinologist, particularly for those patients on insulin-therapy. Patients from Shirak marz were pleased with the care and attitude of their health providers, both GPs and PHC Endocrinologists, which was not the case for patients from Yerevan.

The majority of the diabetes patients reported that they did not check their blood glucose level frequently or regularly, even though many of them had their own glucometer at home.

The main reasons reported for not measuring glucose levels frequently were the high cost of the strips and fear of bad results.

5.2.D Formal and informal payments for treatment

Treatment is covered by the State [free-of-charge] *for children if they belong to certain groups, are younger than seven years old, have a disability status or if they're from socially vulnerable families; otherwise, they have to pay. If these* [diabetic] *children come to us without a reference from the polyclinic, they have to pay for the consultations. However, sometimes we do not charge for consultations even if they are not our patients or haven't been referred.*

Policy maker/Expert 5.2.D.1
FGD, Yerevan

I always pay for doctors myself out-of-pocket. The minimum payment for a doctor's consultation is 5,000 AMD [13USD]*; however, the doctor knows me, so she doesn't take any money.*

Diabetes patient 5.2.D.1
IDI, Yerevan

Since it was my district polyclinic I didn't pay anything.

Diabetes patient 5.2.D.2
FGD, Shirak marz

When I was hospitalized in coma, we made payments only for drugs-we bought them from the pharmacy. We did not pay the health care staff.

Diabetes patient 5.2.D.3
FGD, Shirak marz

We made out-of-pocket payments [during the hospital care] *to the nurses, cleaning ladies and doctors, about 1,000 – 2,000 AMD* [4USD] *to each of them.*

Diabetes patient 5.2.D.4
FGD, Shirak marz

The hospitalization is free-of-charge [a diabetes patient with a disability status] *and we pay only for the drugs, and to express our gratitude of course* ["thank you payment" to providers]. *However, specialists* [other specialists during hospital stay] *do not want to consult you free-of-charge and since we received what was covered by the State, they treated us very poorly.*

Diabetes patient 5.2.D.5
FGD, Yerevan

The majority of patients that visited PHC endocrinologist for care reported that they did not make any payments to providers. However, some patients from Yerevan reported being requested to pay informal payments to PHC providers or the labs for getting the results faster or getting better attitude. Those patients who were hospitalised reportedly made both formal

and informal out of pocket payments to facilities and/or providers, and/or for pharmaceuticals.

5.2.E Supply mechanisms/processes for insulin and anti-diabetic drugs in polyclinics

Request mechanism for insulin and anti-diabetic drugs

Usually diabetes drugs are financed from the State budget through centralized procurement.

Policy maker/Expert 5.2.E.1
IDI, Yerevan

PHC facilities request the needed amount of drugs and insulin quarterly, according to the number of registered diabetes patients.

Policy maker/Expert 5.2.E.2
IDI, Yerevan

Every three months each facility from Yerevan, as well as from the Health Care and Social Support Departments of marzes, provide the number of insulin dependent and independent diabetes patients and the list of needed anti-diabetic drugs and insulin. For insulin, we also receive monthly reports from facilities so that we can plan the allocation of insulin.

Policy maker/Expert 5.2.E.1
IDI, Yerevan

Inadequate supplies of insulin and anti-diabetic drugs in polyclinics

We [polyclinic] *present a list of the diabetes medications that we need for the following month, but we do not get the medications which we have requested.*

PHC provider 5.2.E.1
FGD, Shirak marz

A patient is given one [diabetes] *drug one month then they have to take a different drug next month, depending on what is available at the polyclinic at that time.*

PHC provider 5.2.E.2
FGD, Shirak marz

Often polyclinics provide totally different groups of anti-diabetic drugs, so sometimes people [diabetes patients] *even receive drugs which are not appropriate for their condition*[xiii].

Hospital endocrinologist 5.2.E.1
FGD, Yerevan

We [polyclinic] *do not receive everything that we need, so we end up having to replace one with the other. Sometimes we only receive one kind of medication; therefore, we have to prescribe it to everybody. That's why we're unsuccessful in stabilizing the blood glucose levels of our patients, because the medication is being changed constantly.*

PHC endocrinologist 5.2.E.1
FGD, Shirak marz

You see changing medications all the time, which is very bad for the body. When we acquire

[xiii] The polyclinics provide the drugs that are available in their facility at that moment. The MOH provides drugs that are procured through centralized procurement system.

various kinds of [anti-diabetic]*tablets, we have to prescribe whatever is available- it's quite possible that at that time a certain patient does not need this certain medicine, but since they say they can't afford to buy any medicines you have no choice but to prescribe it to them.*

PHC endocrinologist 5.2.E.2
FGD Yerevan

We receive both long-term and short-term effect insulin. They may be from various pharmaceutical companies ... Of course they can be used together, but you can't help but wonder if constantly changing the insulin could in some way harm the diabetic child.

Policy maker/Expert 5.2.E.3
IDI Yerevan

Each time we have different types of insulin; hence, very often we have to change the entire treatment.

Hospital endocrinologist 5.2.E.2
FGD, Yerevan

Moreover, they [the polyclinic] *give us different brands of insulin each time and don't even warn us that the dosage should be different.*

Diabetes patient 5.2.E.1
FGD, Yerevan

Those people who can afford to buy diabetic medicines continue their treatment, but those who can't afford them either stop the treatment or have to take something else that is available at the polyclinic at that time.

PHC provider 5.2.E.3
FGD, Yerevan

Delays in supplies of insulin and anti-diabetic drugs in polyclinics

It [the insulin supply] *is very regular nowadays. It is especially important for me since I need very high dosage of insulin.*

Diabetes patient 5.2.E.2
FGD, Yerevan

Recently there have been no delays[in the insulin supply]*: we received it even earlier than needed…*

Diabetes patient 5.2.E.3
FGD, Shirak marz

There may sometimes be delays in providing insulin [to polyclinics]. *On average, diabetes patients buy their own insulin 2-3 times a year.*

Hospital endocrinologist 5.2.E.3
FGD, Yerevan

The main issue that we have is the untimely distribution of diabetic medications to our polyclinic.

PHC endocrinologist 5.2.E.1
FGD Shirak marz

If we have patients that need more doses [of insulin] *and we have some left over from another*

patient, we take that and distribute it among these other patients. Therefore, we use all the insulin to the last drop.

Hospital endocrinologist 5.2.E.4
IDI, Shirak marz

We get it [insulin] *from each other* [diabetes patients]*…If someone has extra* [insulin]*…*

Diabetes patient 5.2.F.4
FGD, Shirak marz

There have been instances when the distribution of insulin has been a week or 10 days late. In these cases our patients either have to purchase the medication or we sometimes receive aid from the California Medical Association and we distribute these to our patients until the new batch comes.

Policy maker/Expert 5.2.E.4
IDI, Yerevan

The insulin supply is often delayed, sometimes for 2 weeks, and we [diabetes patient] *have to buy it ourselves until the polyclinic receives its supply.*

Diabetes patient 5.2.E.5
FGD, Shirak marz

Difficulties in distribution of insulin and anti-diabetic drugs to patients

Those who receive Amaryl [an anti-diabetic drug] *come to the polyclinic every 10 days. We are not permitted to prescribe more than 30 tablets, sufficient dosage for 10 days. And they have to come again 10-15 days later. There are long waiting lines in such cases…we are also very busy and it is very difficult to write a prescription again and again…every 10 days…I don't understand why we are not allowed to prescribe an amount for one month treatment.*

PHC provider 5.2.E.3
FGD, Yerevan

…there are long queues and people [diabetes patients] *feel worse while waiting in front of doctors offices for their diabetic drugs. This process is time-consuming and torture for the diabetes patients. They have to approach several offices, have their documents sealed and stamped and be registered in different places, so that they can receive their anti-diabetic drug or insulin.*

PHC provider 5.2.E.4
FGD, Yerevan

The other day, one of the patients had to wait in the polyclinic for 2.5 hours just to see the GP and then me [polyclinic endocrinologist]-*someone taking time away from their work waiting for a pack of Amaril*[anti-diabetic drug].

PHC endocrinologist 5.2.E.3
FGD, Yerevan

Just to prescribe a single drug, I have to fill out two forms, write something here, write something there- take it to the head nurse, have her sign it, then the head of the department has to confirm it and sign it. ... And yet we have to go through this every single month with every single patient over and over again.

PHC endocrinologist 5.2.E.3
FGD, Yerevan

It is so difficult to come and go every time, either to the GP or to the endocrinologist or to the pharmacist- sometimes you are late and the medicine may run out.

Diabetes patient 5.2.E.6
FGD, Yerevan

Someone writes the prescription, another one signs, and a third person stamps…and there are queues everywhere…

PHC provider 5.2.E.5
FGD, Yerevan

Diabetes patients who are weakened by the disease have to go back and forth continuously, go upstairs, downstairs several times…They are chronic diabetes patients and it is meaningless for them to do all these things. Maybe this whole process could be completed one time for a first-time patient but in case of regular chronic patients it is not necessary.

PHC provider 5.2.E.6
FGD, Yerevan

According to the policy makers/experts, insulin and anti-diabetic drugs were purchased through a centralized procurement process by the Government and distributed to the polyclinics and endocrinology dispensaries based on periodic reports of the number of the registered diabetes patients and the amount of required insulin and anti-diabetic drugs.

However, the majority of PHC providers and endocrinologists stated that the number and type of insulin and anti-diabetic drugs distributed often did not correspond to what they requested. Different brands of short and long-term effect insulin were distributed to polyclinics at different times; handsome providers believed that changes of insulin brands may lead to complications among diabetes patients. Both patient and providers indicated that there were also changes in the type and the dosage of anti-diabetic drugs provided to polyclinics, leading to diabetes patients having to take the drug that was available at the polyclinic at the moment and change their drugs periodically. According to endocrinologists, these changes could destabilize patients' blood glucose levels and potentially endanger their health. The patients who could afford purchasing anti-diabetic drugs often did so when their drug was not available at the polyclinics. The number of prescribed anti-diabetic pills was also restricted. For example, doctors were not permitted to prescribe more than 30 tablets or dosage for 10 days. Therefore, patients had to come every 10-15 days. This resulted in long waiting lines for the patients and too much paperwork for the medical personnel.

Most of the diabetes patients indicated that insulin was usually provided on time by the polyclinics, particularly recently. In those situations where insulin supply was delayed diabetes patients would reportedly buy insulin from pharmacies, and excess insulin was reportedly shared among other patients when supply was delayed.

Endocrinologists working in polyclinics and PHC providers claimed that the process for receiving insulin and anti-diabetic drugs was very complicated and time consuming for diabetes patients.

5.2.F Diabetes complication management pathways

Prevention of diabetes complications

I go for check-ups every 3-6 months…The examinations are routine and mandatory and they [polyclinic doctors] *tell us when to take them. They check our heart, eyesight, nervous system and blood. Everything is done at the polyclinic and I have never been sent anywhere else for these tests.*

Diabetes patient 5.2.F.1
IDI, Yerevan

I go every spring, once a year. They [polyclinic doctors] *check my heart, eyes, internal organs and of course blood and urine. I go for my glycogenated hemoglobin test on my own initiative; that test is a paid service.*

Diabetes patient 5.2.F.2
IDI, Yerevan

Once a year we [diabetes patients] *pass some examinations at the polyclinics for all organs. It is free and mandatory.*

Diabetes patient 5.2.F.3
FGD, Shirak marz

…they [PHC providers] *check everything. The village doctor examines me. Then they examine me in Akhuryan. When I go to Akhuryan, they send me to all the rooms, and they check all of my organs separately. Then this year they sent me to the hospital. The entire treatment was free and I paid nothing.*

Diabetes patient 5.2.F.4
IDI, Shirak marz

Of course, I had a Doppler-angiography and an eye exam [at a private clinic] *based on a referral by my endocrinologist. However, during the last year my vision has not been checked. It is up to me. I seek care whenever I feel bad.*

Diabetes patient 5.2.F.5
IDI, Yerevan

I went to have the Doppler examination of my feet and vein dilation was detected. I did this examination based on my own initiative. I had some complaints… My eye funds were examined in thee polyclinic but I never had feet problems…That is why the polyclinic doctor

did not refer me for a foot examination…

Diabetes patient 5.2.F.6
FGD, Yerevan

Only eye fundus examination is free at the polyclinic. The rest of the examinations that are necessary for the prevention of complications are not provided at the polyclinic.

PHC provider 5.2.F.1
FGD, Yerevan

Once every year we send diabetic patients to the eye fundus examination; it is mandatory [at the polyclinic].

PHC provider 5.2.F.2
FGD, Yerevan

We perform all examinations for diabetes patients- glucometry, eye-fundus examination, electrocardiography (ECG), and so on once a year. And if needed, we do extra examinations if the patients have certain complaints.

PHC provider 5.2.F.3
FGD, Shirak marz

Current complication status of diabetes patients

I have problems with my heart. I have high blood pressure and problems with my lower extremities.

Diabetes patient 5.2.F.5
IDI, Yerevan

My toes are amputated.

Diabetes patient 5.2.F.7
FGD, Yerevan

After my heart problems began, I underwent a coronary bypass…I suppose this was the result of my high glucose level.

Diabetes patient 5.2.F.6
FGD, Yerevan

I was hospitalized because my level of glucose was very high. I also had pain in my feet and the kidney, but the treatment didn't help. Now I have problems with vision and the ophthalmologist prescribed some medicine.

Diabetes patient 5.2.F.8
FGD, Shirak marz

I have not had any diabetes-related complication, because I have always been careful.

Diabetes patient 5.2.F.1
IDI, Yerevan

I mainly have adult patients with complications- neuropathy, polyneuropathy, angiopathy, etc. We do not have cases with amputation in our clinic, but I meet amputated patients from other clinics.

Hospital endocrinologist 5.2.F.1
IDI, Shirak marz

We do not have many cases of diabetic foot complications [in their region]*; usually these are managed both by the polyclinic GP and the surgeon. I don't have any amputees because of this in my district… One of the major frequent diabetes complications is retinopathy.*

PHC provider 5.2.F.4
IDI, Shirak marz

Diabetes is one of the causes of cardiovascular disorders. We have many cases where diabetes patients have complications related to heart and peripheral vascular diseases and all kinds of other complications.

Policy maker/Expert 5.2.F.1
IDI, Shirak marz

Reasons for diabetes complications

Complications arise if they [diabetes patients] *wait too long* [to seek care] *and don't come in on time.*

PHC endocrinologist 5.2.F.1
FGD, Yerevan

…the registered patients don't come in for their regular checkups. If their eyes or arms or legs do not hurt then they don't show up.

PHC endocrinologist 5.2.F.2
FGD, Shirak marz

The majority of complications are coronary-vascular diseases. Eye problems, blindness and other problems are less prevalent because polyclinic doctors explain the problems to diabetes patients and monitor the conditions better now. But heart diseases are difficult to detect. Sometimes ECG is not as informative.

Policy maker/Expert 5.2.F.2
IDI, Yerevan

About 80% of our adult patients have some complications and a large proportion of children have them too because their glucose level is not compensated properly… They [children] *reach an endocrinologist already in coma.*

Policy maker/Expert 5.2.F.3
IDI, Yerevan

Treatment pathway for diabetes complications

In December 2009 I developed a foot wound on the upper lateral side, and since then I was also prescribed insulin injections. Because of the wound I visited the hospital, where they [doctors] *bandaged my foot. However, on the fourth day I started feeling a severe pain. They told me that they couldn't help me and referred me to the military hospital. However, the doctor there wasn't able to help. So my endocrinologists advised that I go to a private surgeon in his private clinic who specialized in diabetic patients and diabetic foot complications. I did and he was successful in curing my leg… When I go for bandaging at that private clinic, I pay 5,000 AMD* [13USD] *each time for the consultation. I also pay for the drugs, which are very expensive-up to 35,000 AMD* [90USD] *for the 15-30mg ointment.*

Diabetes patient 5.2.F.5
IDI, Yerevan

It doesn't matter how sick you are and what kind of complications you have, they [doctors] *don't treat you or do anything for you unless you pay for it. They* [doctors in polyclinic] *scream and shout at you and it makes me upset because they have no right to speak to us in that way.*

Diabetes patient 5.2.F.9
FGD, Yerevan

My blood pressure is very high and I even had some thrombosis, so I went to see a very good specialist and he prescribed a complex treatment. These medicines are very expensive. I spend about 30,000 AMD [77USD] *for these. I just don't have a choice because if I don't take them I will die.*

Diabetes patient 5.2.F.10
FGD, Yerevan

I stay in a hospital once a year for my disability status and also arrange for home treatment one or two times per year. One intravenous infusion costs 1,500-2,000 AMD [4USD] *at home, but 1,000 AMD* [3USD] *in the hospital plus the cost of the drugs. If you don't pay* [informal payments to the nurses for treatment] *they* [the nurses] *might prick you so hard that you would lose your consciousness! They can even withhold your injection…*

Diabetes patient 5.2.F.11
FGD, Yerevan

In case of complications, not all patients can afford to buy the medicines which they need to prevent these complications because they are very expensive and are not provided by the polyclinics free-of-charge.

PHC provider 5.2.F.2,
FGD, Yerevan

In in-patient care it is possible to control complications among diabetic patients- we have different specialists in our hospital and send them [diabetes patents] *for consultations with these specialists. However, the situation is different outside the hospital. Diabetes patients do not consult with specialists for complications due to financial reasons…All of thesis on the patients' shoulders and very often they cannot afford to visit all these specialists and purchase all the necessary drugs for their diabetes complications.*

Hospital endocrinologist 5.2.F.2
IDI, Yerevan

At first patients undergo examination, followed with computerized ultrasound examination if necessary. If they have a disability status, it is free-of-charge. If not, they have to pay 17,000 AMD in cash for an ambulatory medical record which includes one year of free consultations and some examinations…not everything, but a certain set of examinations…For example, computerized eye examination costs 25,000 AMD [64USD] *for one eye, but reexamination is free during that year.*

Other specialist 5.2.F.1
IDI, Yerevan

If a diabetes patient has lymphopathy and we need nephrologists, we refer our patients to one. The eyes are examined by an ophthalmologist. If we need a cardiovascular specialist we turn to them. Since we have a large clinic with specialists, we refer the patients to the appropriate specialist.

Policy maker/Expert 5.2.F.4
IDI, Yerevan

Management of diabetic patients with complications is a problem as I have mentioned above, because it is not funded by the State. We do not have any specialized services for diabetes complication management. They [diabetes patients] *come to the hospitals with different disorders. Because all hospitals are now private, they have to pay for everything; the exceptions are only for those patients who fall under the Basic Benefit Package. The main constraint is money.*

Policy maker/Expert 5.2.F.5
IDI, Yerevan

Links between endocrinologists and other specialists involved in diabetes complication care

It should be a collaborative multidisciplinary approach. If the patient comes to us with a controlled level of glucose 4-5, max 6mmol/l [controlled by an endocrinologist]*, then after their discharge we* [surgeons] *are prepared to collaborate with the endocrinologist. However, if people come in here with a glucose level of 10 mmol/l and over and their endocrinologist doesn't care about that, then we advise them to seek another endocrinologist whom we know personally and trust. We keep in contact with those endocrinologists by phone.*

Other specialist 5.2.F.2
IDI, Yerevan

If the complication is progressing, we write the diagnosis on a paper and give it to the patients to show it to their endocrinologist…If a patient comes to the hospital and the care is covered by the State there is a special space on the referral form where we write the diagnosis and send them back with the patients to the polyclinics. If it is just a paid visit, we give a conclusion with the date, time, examinations and results, and diagnosis.

Other specialist 5.2.F.1
IDI, Yerevan

Another problem is when there is no direct link between endocrinologists and us[other specialist]*; patients are sent by the endocrinologist to our center, we arrange their care here, and then give the epicrisis*[the medical card given to the patient at hospital discharge]*to the patient, who may or may not provide this to his/her endocrinologist.*

Other specialist 5.2.F.1
IDI, Yerevan

There is no connection between us [hospital endocrinologists] *and the polyclinics, although patients are registered at the polyclinic to receive their drugs and can be referred to the hospital as needed.*

Hospital endocrinologist 5.2.F.3
FGD, Yerevan

The link between physicians is not good; if the patient approaches a doctor with an epicrisis [the medical card given to the patient at hospital discharge] *or their medical records then they will know their medical history and every necessary detail, but this is not how it is usually done. Sometimes, the diagnosis and treatment of complications is delayed due to this* [lack of provider coordination]*, but it depends on the situation….*

Policy maker/Expert 5.2.F.4
IDI, Yerevan

Many diabetes patients and providers reported about annual checkups in polyclinics for free, which includedeye-fundus examinations, heart and nervous system examinations and blood work. In case of a need the patients were referred to hospitals. However, many health providers agreed that these examinations were not enough for preventing all diabetes' complications.

According to health care providers, the majority of diabetic patients had already developed complications, especially coronary-vascular diseases, neuropathy, polyneuropathy, angiopathy and retinopathy, because of seeking care too late or inappropriate diabetes management.

According to almost all participants, the treatment of diabetes complications was very expensive. Patients entered the hospital for treatment based on their own initiative or on their doctor's referral. However, many diabetes patients reportedly delayed treatment for complications due to high cost. Having a disability status provided some free hospital care services for the diabetes patients but many diabetes patients did not have a disability status.

According to some policy makers/experts and providers, there was lack of coordination of efforts between different providers from different facilities and this also led to delays in appropriate treatment of complications. Having a common diabetes registry could help to resolve this problem.

5.2.G Patients' compliance with treatment

Poor adherence to treatment
He [endocrinologist] *told me to stop taking the medication that the previous doctor had prescribed because it* [Diabeton] *was just "chalk" from Georgia and would only hurt my stomach. I was instructed by him to go on a diet. I think that maybe I would have been well if I had in fact followed the diet. He told my son to bring the medication from Russia - since he was going there - and meanwhile I was supposed to follow the diet. I believed him instead of the woman at the polyclinic, because he had been a doctor for such a long time, and he said that the medicine was just chalk and it would harm my stomach. So we ended up paying 12,500 AMD* [32USD] *to buy some drugs that he had prescribed from the pharmacy. So I took those, but then my son went to Russia, and I just stopped paying attention to my diet or taking any medication. After that he* [her son] *got engaged and we were very busy with all that, so I no longer took care of myself - neither medicines, nor diet.*

Diabetes patient 5.2.G.1
FGD, Yerevan

…sometimes I forget to take my drug. We have a lot of daily work and sometimes it is difficult to remember everything, as one's head is overloaded with daily work.

Diabetes patient 5.2.G.2
FGD, Shirak marz

It is difficult to follow the treatment, to stick to the diet…for example, my daughter-in-law is very attentive and she looks after me. But sunflower oil [included in the recommended diet] *harms my stomach…I can't eat it anymore. It is very difficult* [prefers animal fat].

Diabetes patient 5.2.G.3
FGD, Shirak marz

The main problem with poor adherence to treatment is the mentality of our population; they do not understand the importance of following prescriptions. Another issue is the financial inability to afford drugs.

Hospital endocrinologist 5.2.G.1
IDI, Yerevan

The psychology of our people is also interfering with effective management, because when the GP refers them to a specialist at the polyclinic, people think that he/she is passing them from one specialist to another [implying that this is bothersome for diabetes patients and may impact their compliance with treatment].

Hospital endocrinologist 5.2.G.2
FGD, Yerevan

Very often they [diabetes patients] *don't even take it* [medicine] *as they don't understand the seriousness of their condition.*

PHC provider 5.2.G.1
FGD, Yerevan

There are of course patients who are not very consistent or organized and forget their medication, but the main reason for not continuing with their treatment at home is the financial issue.

Policy maker/Expert 5.2.G.1
IDI, Yerevan

The problem is that there is non-compliance when it comes to the diabetes patient because we [endocrinologists] *tell them that this is the treatment that they need, but they just can't afford to purchase these medicines. If they can't afford the medicines, we have no other choice but to find cheaper alternatives for them.*

Policy maker/Expert 5.2.G.2
IDI, Yerevan

Patients' attitude towards their health

I wasn't taking any anti-diabetic drugs. I just drank a glass of juice made from greens such as celery, sweet potatoes, green apples and others. I was very busy and had completely forgotten about my diabetes and neglected myself, so I'd just eat everything with everybody, except for sweets.

Diabetes patient 5.2.G.1
FGD, Yerevan

… After that when I felt that I was always thirsty, I took the glucose test again. My glucose level was high, but I ignored it again. The doctor sent me to take another test [glycogenated hemoglobin test] *that showed what my glucose level was high… But again I didn't care about myself. I didn't imagine how sick a person can become* [from diabetes].

Diabetes patient 5.2.G.4
FGD, Yerevan

I have never taken care of myself, because I have always had something more important to care for. If I had sought help when I started having health problems I would not have these complications now. The doctors always call to check how I am and always visit me. At times my daughter-in-law is the one who goes to collect my medication instead of me and the doctors always worry that I should have come instead, and that I should take better care of myself. I think other things are more important than my life…

Diabetes patient 5.2.G.5
IDI, Shirak marz

I am always stressed... I have a mentally ill husband at home, and I have to take care of him.

Diabetes patient 5.2.G.6
FGD, Yerevan

It is difficult to stick to the treatment plan, but we [diabetes patients] *have no other choice because non-compliance can develop into health problems in the future.*

Diabetes patient 5.2.G.7
IDI, Yerevan

They do not trust doctors. Lack of awareness about their health and ignorancetowards their health leads to an increase of diabetes and its complications in our country.

Hospital endocrinologist 5.2.G.3
IDI, Yerevan

People do not feel responsibility towards their own health; there are a lot of people who continue smoking, drinking and using sweets, despite the myriad of recommendations against these behaviors.

PHC provider 5.2.G.2
IDI, Shirak marz

Diabetes patients are in panic when they find out about their disease [diabetes], *but after a while when the disease becomes chronic and they really need to panic to avoid complications, they just get used to it and ignore it.*

PHC endocrinologist 5.2.G.1
FGD, Yerevan

Our patients do not take care of themselves. They think that having high glucose today does not mean it will be high tomorrow and it will not harm them. They just don't understand the disease…

PHC endocrinologist 5.2.G.2
FGD, Shirak marz

If the patient is unwilling to take care of his/her health, then the doctor's work becomes useless.

Policy maker/Expert 5.2.G.3
IDI, Yerevan

Patients' compliance with treatment reportedly was poor. Among reasons for this the participants mentioned the following explanations: personal health not being a priority, feeling well and not considering the consequences of non-compliance, high cost of medicines and appropriate diet. In addition, the attitude of many patients towards diabetes was not appropriate, which could be explained by insufficient knowledge of diabetes patients about the seriousness of the disease.

5.3 Outcomes

5.3.A Health outcomes

Morbidity and mortality

The numbers of diabetes patients are increasing and there are more new cases among young people. For example, during this one year I personally diagnosed 10 new cases.

Hospital endocrinologist 5.3.A.1
IDI, Shirak marz

Maybe diagnostics have improved, or maybe morbidity has really increased…I don't know…

PHC provider 5.3.A.1
FGD, Shirak marz

Perceived diabetes risk factors

I was stressed after my son's disease- he has epilepsy…My mother and sister had diabetes. My sister lost her foot due to gangrene. Maybe it also has a hereditary factor but it was definitely provoked by the stress.

Diabetes patient 5.3.A.1
FGD, Yerevan

I have a sick child, I'm always taking care of him and don't sleep well at night… If you are calm, if you are not stressed and sleep well then I think that your blood sugar level will be normal. I feel so much better whenever I get to sleep at night.

Diabetes patient 5.3.A.2
IDI, Shirak marz

I have had it [diabetes] *since childhood, since I was 9 years old. It started because of the stress at the time of the earthquake* [in 1988].

Diabetes patient 5.3.A.3
FGD, Shirak marz

I know where my disease [diabetes] *comes from. I had so much stress in my life; during the earthquake* [in 1988] *I saw houses collapse right in front of my eyes… I was attacked and*

bitten by a dog…and all these stresses affected me along with the menopause… People say that it is inherited… I disagree; this is because we all live together and experience all these stresses together, that is why my relatives and I have diabetes, which isn't just due to heredity.

Diabetes patient 5.3.A.4
FGD, Shirak marz

Diabetes is due to obesity, sedentary lifestyle, stress as well as the diet of our population. Due to financial difficulties our population eats pasta, potatoes and other food that aren't rich in proteins all day long.

Hospital endocrinologist 5.3.A.2
IDI, Yerevan

I think family history and also stress, which is a trigger factor for diabetes. Women, particularly those above 45 years of age are at risk, as well as those who are unemployed as this is also a stress… Regarding physical activity, our people do not walk just for staying healthy.

PHC provider 5.3.A.2
IDI, Shirak marz

Some people do not do anything to be healthy. They just go home, sit on the couch in front of the TV, eat sweets and don't move at all. Look at the way our men are living their lives; we have to explain to them about prevention, that they are healthy and they should protect their health , because if they don't follow a healthy lifestyle then we cannot help them.

Policy maker/Expert 5.3.A.1
IDI, Yerevan

The devastating earthquake in 1988 was a tremendous stress factor for our population. Children then are now 20-30 year old men and women facing different health problems. It [the impact of the earthquake] *did not disappear; we feel the consequences of that disaster today. It exacerbated all social and psychological problems, which are the major facilitating factors for diabetes, cancer and psychological problems.*

Policy maker/Expert 5.3.A.2
IDI, Shirak marz

As a pediatric endocrinologist, I have noticed that [the rates of diagnosis of] *type I diabetes has a seasonal pattern.*

PHC endocrinologist 5.3.A.1
FGD, Shirak marz

Some health providers suggested recent increases in morbidity and mortality of diabetes in Armenia. The most commonly perceived risk factor for diabetes by the majority of participants was stress; almost all participants from Shirak marz emphasized the health hazards of the stress related to the earthquake of 1988. Other identified risk factors for diabetes included family history of diabetes, overweight, physical inactivity, poor diet and low socioeconomic status.

5.3.B Stigma associated with diabetes

Stigma related diabetes type I

There are people who do not want others to know that they have diabetes [type I], *so they hide their disease.*

PHC provider 5.3.B.1
IDI, Shirak marz

Parents prefer to hide this [the child's diabetes] *from teachers in schools as well. I have a case, where the parents prefer that their child remains hungry from 9:00 a.m. till 2:00 p.m., rather than inject insulin after lunch at school.*

Hospital endocrinologist 5.3.B.1
FGD, Yerevan

In Gyumri people do not bring their daughters [with diabetes] *to the doctor; they take them to Yerevan so that nobody knows that they have a health problem.*

PHC endocrinologist 5.3.B.1
FGD, Shirak marz

I have been a scholar, a student, and now I am an employee, but nobody has ever known that I have the disease … I inject myself in the lavatory or in my office. I lock the door during injections…I eat sweets only when I am a guest in a place where nobody knows about my disease –otherwise, I don't eat sweets or chocolate…

Diabetes patient 5.3.B.1
FGD,Shirak marz

When I was younger [during Soviet times] *there were special diabetic camps and schools for diabetic children, but I'd stay away because I preferred being in contact with normal people rather than being considered sick, because as much as diabetes is a way of life, it's also a disease.*

Diabetes patient 5.3.B.2
IDI, Yerevan

People are trying to hide the fact that they have diabetes. I say, "Look it is not syphilis, why are you ashamed of it?" … maybe such behavior is to protect the person's marriage prospective, because diabetes is genetically inherited and they are afraid of being denied.

Policy maker/Expert 5.3.B.1
IDI, Yerevan

There is stigma [diabetes related] *among the population; diabetes in our population is considered similar to drug addiction…this is why parents hide it.*

Hospital endocrinologist 5.3.B.2
IDI, Shirak marz

Fear related to insulin use among diabetes type II

She [the polyclinic GP] *was forcing me to start insulin, and I was telling her that I don't want to do that and why are you forcing me? If insulin becomes absolutely necessary then I will take it, but right now I am responding to my medication, so I refuse.*

Diabetes patient 5.3.B.3
FGD, Yerevan

People [diabetes patients] *are reluctant to receive insulin; to them this seems like the same thing as using narcotics.*

Hospital endocrinologist 5.3.B.3
FGD, Yerevan

Insulin is perceived as being a bad thing, causing fear…

Diabetes patient 5.3.B.4
FGD,Shirak marz

…There have been cases when we injected insulin but did not tell the diabetes patient, because they were scared. Insulin is associated with the last stage of disease; to them it is equivalent to cancer.

Hospital endocrinologist 5.3.B.4
IDI, Shirak marz

I have a neighbor that also has diabetes but takes pills…every time we meet; she asks me why I take insulin injections, since I am so young… I would suggest that she takes insulin injections instead of drugs. She disagrees, and tells me that insulin injections are for the terminal stage of disease and we are too young to take it…The same situation is with my brother-in-low. I always advise him to take insulin. But he disagrees and says that he feels very bad that I take insulin, because from his perspective it is like a treatment for the terminal stage.

Diabetes patient 5.3.B.5
FGD, Shirak marz

All participants agreed that diabetes type I carried a heavy stigma and fear. Diabetes type I patients reportedly hided their disease status from almost everyone- this was especially true among younger patients, as having diabetes could impact marriage opportunities. Diabetes patients indicated that the stigma could be a serious obstacle to compliance with both insulin injections and appropriate diet.

Insulin injections were related to fear among diabetes type II patients as well - insulin injections were perceived as kind of a drug addiction and/or were considered as a sign of being in the terminal stage of the disease.

5.3.C Diabetes patients' nutrition

It is difficult for us [diabetes patients]. *You can't purchase everything that you need. You're supposed to have good nutrients, meat and fish daily, but it's so expensive when you purchase all of that for the entire family. You have to be very rich or have someone supporting you financially; otherwise, you just can't do it.*

Diabetes patient 5.3.C.1
FGD, Yerevan

I have 55 patients with diabetes in my catchment area and only one or two of them can afford

an appropriate diet because they have relatives living abroad who send special diabetic food for them. What about the others?

PHC provider 5.3.C.1
FGD, Shirak marz

How can you stick to your medication and diet when you have no money?

Diabetes patient 5.3.C.2
FGD, Yerevan

It's very difficult for them [diabetes patients] *to follow our instructions, especially for the diet. They just eat whatever they have. Have you seen how expensive the diabetic chocolate and cookies and other special diabetic foods are? They are around four times more expensive than regular food.*

Hospital endocrinologist 5.3.C.1
FGD, Shirak marz

Some people can only afford to eat bread and macaroni…what kind of diet can we recommend to our diabetes patients if they are not able to follow it?

PHC provider 5.3.C.2
FGD, Yerevan

If you have diabetes, you need to receive adequate nutrition as well. I inject high doses of insulin – 33 cc in the morning, 22 in the evening – so if I don't receive adequate nutrition, will I be able to tolerate that much insulin? So what am I supposed to do? Pay for the food or the medication?

Diabetes patient 5.3.C.3
IDI, Shirak marz

The most stressful thing is that there is no bread available for diabetics, which means that we [diabetes patients] *shouldn't eat bread. It is sold just in one shop for 600 drams, but you never know if it is appropriate for diabetics or not. There are some special sections in the supermarkets that are for diabetics, but everything is 3-4 times more expensive than regular food.*

Diabetes patient 5.3.C.4
FGD, Yerevan

Diabetics are in a very difficult situation, especially when it comes to their nutrition. A diabetic, with a second category of disability status receives a pension of about 23,000 AMD [59USD]*. What can they possibly buy to eat with that money? They're supposed to buy special food for diabetics, which is very expensive here. There used to be specialized shops for diabetics during the Soviet years, but even the most basic thing such as buckwheat is 1,000 AMD* [3USD] *per kilo.*

PHC endocrinologist 5.3.C.1
FGD, Shirak marz

In the Soviet times there were stores where diabetic patients could receive special food free of charge. We do not have such stores now and diabetic food is very expensive and not affordable to us.

Diabetes patient 5.3.C.1
FGD, Yerevan

Polyclinics should provide some food for them [diabetes patients]. *Each doctor should be provided with some food for his/her diabetes patients* [free-of-charge].

PHC provider 5.3.C.1
FGD, Shirak marz

Most of the participants stressed that the special food for diabetics was not affordable for most patients. In addition, patients indicated that the availability of such products were limited to a very few outlets and were not very accessible. Because of the serious difficulty for many diabetics to acquire special food, some health care providers supported the idea of providing special free food for diabetics through polyclinics.

5.3.D Diabetes impact on patients quality of life

Quality of life

When I feel well I get up, move around, do my work and feel a bit better. Otherwise, I'm just lying in bed all day long… If my sugar level is up, then automatically I am uncomfortable and I spend the day lying down. I don't know- I just can't describe the state it leaves me in.

Diabetes patient 5.3.D.1
IDI, Shirak marz

I can't walk; I can't go out, because somebody has to carry me everywhere.

Diabetes patient 5.3.D.2
FGD, Yerevan

The impact of diabetes is very bad. I live alone. In the mornings I am so tired that I do not want to get up and do housework. I worked before, but now I can't walk very far, so I quit my job. I even want to die.

Diabetes patient 5.3.D.3
FGD, Shirak marz

I worked for two months and became so exhausted that I spent my entire salary on treatment and had intravenous infusion therapy to feel better. How can I work? I get up in the morning feeling tired right away…The difficulty for diabetics is that they don't have anything to be engaged in…to be busy…to work…We are neglected.

Diabetes patient 5.3.D.4
FGD, Shirak marz

I have high blood pressure; when it is 140[mm Hg] *it is good, but it often increases to 200 - 250*[mm Hg]. *Moreover, my legs and arms are swollen and it is very painful… My GP told me that I have to walk a lot and I do, but I get tired easily and try to find places to rest.*

Diabetes patient 5.3.D.5
IDI, Shirak marz

I can't sleep at night. And unless I drink 4-5 cups of coffee, I can't do anything.

Diabetes patient 5.3.D.6
FGD, Shirak marz

I [type I diabetes patient] *don't consider myself ill, even my parents-in-law didn't realize that I had diabetes. I can even do heavy physical work.*

Diabetes patient 5.3.D.7
FGD, Shirak marz

Family support

I don't go [to the polyclinic] *each month; my parents get my medication… I am a student and often can't go.*

Diabetes patient 5.3.D.8
IDI, Yerevan

I receive insulin twice per day, but my glucose level is still very high and varies a lot… My son and daughter-in-law often do not even tell me about the level, not to frighten me.

Diabetes patient 5.3.D.5
IDI, Shirak marz

My husband and my mother in-law help me strictly follow my dietary regimen…

Diabetes patient 5.3.D.9
FGD, Shirak marz

Before developing diabetes I did not like sweets, but now I am crazy about them... My husband even counts the chocolates before he leaves home.

Diabetes patient 5.3.D.10
FGD, Shirak marz

Sometimes my grandchild reminds me to take a drug.

Diabetes patient 5.3.D.11
FGD, Shirak marz

My sons and daughter-in-law protect me from all types of problems; I do not even do housework. They are very attentive to me and my health.

Diabetes patient 5.3.D.12
FGD, Yerevan

The family environment [of the diabetes patient] *should be good, so people will be calm and not get angry and stressed.*

Diabetes patient 5.3.D.13
FGD, Yerevan

The majority of diabetes type II patients reported about limiting daily activities of living because of fatigue due to diabetes. A few younger diabetes patients (type I) were still active, working and currently did not have any restrictions in their daily activities. A few diabetes patients reported about mental health challenges, particularly depression.

Almost all diabetes patients reported that their family support (both financial and social) was very important in their diabetes management.

6. Discussion

6.1 Enabling factors and obstacles to access care for diabetes and its complications from diabetes patients' and providers' perspectives

The research team identified the following enabling factors to access diabetes care:

- There is a functional infrastructure for diabetes care in Armenia. There is a system in place for sharing medical histories of diabetes (the "epicrisis" document) between hospital endocrinologists, other specialists, PHC endocrinologists and GPs.
- There are more than sufficient numbers of endocrinologists as well as other specialists to address the burden of diabetes and diabetes complications.
- The majority of endocrinologists and GPs are trained in diabetes management.
- There is a diabetes management guideline for the PHC GPs approved by the MoH.
- Insulin and some anti-diabetic drugs are provided free-of-charge in the polyclinics to diabetes patients.
- Access to a reliable supply of insulin in polyclinics significantly improved.
- Hospitals and private medical centres are well equipped with lab tests, equipment and supplies for providing the necessary care for diabetes patients.
- There are sources of information on diabetes management for diabetes patients in Armenia. These include health care providers, international and non-governmental organizations, other diabetes patients, books, pamphlets, internet and TV.
- Diabetes patients' families typically provide important psychosocial and social support for diabetes patients and assist them in compliance with their diabetes treatment plan.

There are many factors that the research team identified to be obstacles to appropriate diabetes management:

- A shortage of supply of free anti-diabetic drugs in polyclinics leads to many diabetes patients to purchase these drugs themselves (if they can afford it), putting a heavy financial burden on diabetes patients.
- Changes in the types and brands of anti-diabetic drugs supplied at the polyclinics leads to inappropriate changes in the treatments of diabetes patients, leading to destabilization of their blood glucose levels and increasing the risk of complications.

- Occasional delays in the free insulin supply at the polyclinics leads diabetes patients to purchase insulin at pharmacies or to share left-over doses of insulin from other diabetes patients, interrupting their injections of insulin.
- The high expense of drugs for the prevention and care of diabetes complications, which are unaffordable for most diabetes patients, leads to increased rates of diabetes complications among diabetes patients.
- Lack of free consumables, such as glucometers, strips and syringes, are a major obstacle to ensure appropriate care among diabetes patients. The high price of strips especially often leads to irregular blood glucose level checks and poor control of blood glucose level among diabetes patients.
- Advanced laboratory tests such as glycogenated haemoglobin and the Doppler examination which are needed for appropriate diabetes management are frequently not affordable for many diabetes patients and are not available at the polyclinics.
- Lack of diabetes screening programs in the country impedes the early detection and prevention of later stages of diabetes among the Armenian population.
- Lack of diabetes foot care complication cabinets and appropriately trained specialists in the country in diabetes foot care hinders timely and appropriate care, leading to unnecessary amputations.
- The high price of diabetic dietary foods, unaffordable for many diabetes patients, increases non-compliance to diabetes dietary plan, increasing the risk of complications.
- The high social stigma associated with diabetes and insulin use leads to hiding the disease from others which in turn leads to poor compliance to treatment, especially among younger diabetes patients.
- The high price of hospital care for many diabetes patients (those who do not have an official disability status) is a barrier to seek timely hospital care and appropriately control diabetes complications.
- There are some shortages of endocrinologists in more remote regions of Armenia and a heavy concentration of these specialists in Yerevan.
- There is a need for continuous medical education trainings in diabetes management. However the high price of mandatory trainings and only with the top specialists being invited to professional training sponsored by the pharmaceutical companies hinders the improvement of overall diabetes management, especially for more remote regions.

- Lack of MoH unified clinical guidelines for diabetes management for endocrinologist's leads to utilization of different treatment plans and approaches by different specialists that may not always reflect best practices.
- The lack of direct communication infrastructure between PHC GPs and polyclinic endocrinologists with hospital endocrinologists and other hospital specialists dealing with diabetes complications leads to poor coordination of treatment and monitoring diabetes patients.
- The heavy burden of paper work placed on the PHC GPs and endocrinologists reduces the time for diabetes patient consultation and creates longer waiting lines in polyclinics, reducing the quality of care.
- Low salaries of providers- PHC GPS and endocrinologists- lead to job dissatisfaction and reduce their motivation to provide the best quality of care to diabetes patients.
- Lack of a comprehensive national diabetes registry that would provide information on outpatient visits to all health care facilities (including private medical centres and hospitals) will ensure a way to measure the burden of disease and to monitor patients' treatments, to inform policy makers in Armenia.

6.2 Integration of diabetes care within the health care system

Having regular diabetes care fully integrated in the primary healthcare system helps to better connect with the general health care system in Armenia. However, there is a need for improvements. Currently there is lack of coordination of efforts between diabetes care in polyclinics and hospitals and private medical centres that provide care to more complicates cases. The lack of coordination and communication between these institutions threatens the quality of diabetes care and potentially puts the diabetes patients, particularly those with complications, at a greater risk for lower quality care.

6.3 Major contextual factors that may influence diabetes care in Armenia

In April, 2011 the Government of Armenia adopted the National Strategy on the Most Prevalent Non-Communicable Diseases in Armenia: CVD, Oncology Diseases and Diabetes. The strategy establishes the main activities to improve diabetes care in the country. The strategy focuses on early prevention and treatment of diabetes and its complications. The aim of this Strategy, starting 2012, is to strengthen the diabetes care system in Armenia and ensure that all diabetes patients have improved access to diabetes health care services.

The Child Health Care Certificate project implemented in Armenia in January 2010, aimed to provide free hospital care to children less than seven years of age with increased State funding for paediatric in-patient care, improving access and reducing informal payments for hospital care for these children- including those children hospitalized for diabetes care.

7. Policy recommendations

Based on the literature and document review, the study findings and recommendations provided by the study participants, the research team has developed the following feasible policy recommendations to improve diabetes care system in Armenia:

- Increase financing of diabetes care. Even small increases in the budget can effectively strengthen and enhance diabetes care in Armenia.
- Establish diabetes foot complication care units with trained specialists that could provide appropriate subsidized care to diabetes patients with foot complications.
- Expand the coverage of free or discounted anti-diabetic drugs and other drugs needed for diabetes complications care for diabetes patients.
- Consider providing support to diabetes patients for consumables (glucometers, strips, syringes).
- Establish a national comprehensive diabetes registration system to ensure the collection of information about diabetes patients' outpatient visits to all facilities, including private medical centers and hospitals.
- Provide free-of-charge training for health care providers working with diabetes patients, with particular emphasis on those providers in remote areas.
- Organize population educational campaigns on diabetes to reduce stigma on diabetes and insulin use among diabetes patients as well as the general public and improve treatment adherence among diabetes patients.
- Expand diabetes educational sessions for diabetics and find alternative funds for their financing.
- Improve access to subsidized diabetic dietary food for diabetes patients.
- Establish a system of rehabilitative and psycho-social support to diabetes patients.

References

1. Nazaretyan; M, Hakobyan; T, Makarova; T, Aristakesyan; M, Margaryants; H, Nolt; E. *Armenia. Health System Review. Health Systems in Transition.* European Observatory on Health Systems and Policies 2006.
2. The Government of the Republic of Armenia. General Information. http://www.gov.am/en/official/ Accessed 22 November 2011.
3. The Governmnet of the Republic of Armenia. Demographics. http://www.gov.am/en/demographics/. Accessed 22 November 2011.
4. The Governmnet of the Republic of Armenia. Regions. . http://www.gov.am/en/regions/ Accessed 22 November 2011.
5. Balabanova D, Chikovani I, McKee M. *Guidance for Rapid Appraisal of Diabetes Care from user perspective (toolkit). Developed for a multi-country study within the HITT project*: London School of Hygiene and Tropical Medicine July 2011.
6. Curry L, Nembhard I, Bradley E. Qualitative and Mixed Methods Provide Unique Contributions to Outcomes Research. *Circulation.* 2009;119:1442-1452.
7. Patton M. Qualitative Evaluation and research Methods. *2nd ed. Newbury Park: SAGE Publications.* 1990.
8. Meyer J. Qualitative Research in Health Care: Using Qualitative Methods in Health Related Action Research. *BMJ.* 2000;320:178-181.
9. Hsieh H-F, Shannon S. Three Approaches to Qualitative Content Analysis. *Qualitative Health Research* 2005;15.
10. NSS. Social Snapshot and Poverty in Armenia: Statistical Analytical Report. Yerevan, Armenia 2008. 2008; http://www.armstat.am/file/article/poverty_2008e_00.pdf. Accessed August 3, 2011
11. Pawson R, Greenhalgh T, Harvey G, Walshe K. Realist review - a new method of systematic review designed for complex policy interventions. *J Health Serv Res Policy.* Jul 2005; 10 Suppl 1:21-34.
12. Pawson R GT, Harvey G, Walshe K. ealist review - a new method of systematic review designed for complex policy interventions.
13. WHO. European Health for All Database. 2011; http://data.euro.who.int/hfadb/. Accessed January 13, 2012.
14. NIAC. *Health and Health Care in Armenia. Annual Statistical Report, 2010.* Yerevan National Information Analytic Center (NIAC) of the National Institute of Health (NIH) of RA; 2010.
15. MoH. The National Strategy on Diabetes Mellitus. Appendix 3 based on the Extraction from N 11 minute of the Governmental session of the Republic of Armenia in March, 24, 2011. The Ministry of Health of RA.
16. Alexandr Bazarchyan, The Head of the Public Health Department at the Ministry of Health of RA. In: CHSR/AUA, ed. YerevanDecember29, 2011:Personal Communication.
17. FAO. *Nutrition Country Profile-the Republic of Armenia* Food and Agriculture Organization of the United Nations (FAO); 2005.
18. MoH;, WB;, WHO. *Armenia, Health System Performance Assessment.* Ministry of Health (MoH) of RA, the World Bank (WB), the World Health Organization (WHO); 2009.
19. Petrosyan Y, Petrosyan V. Risk Factors for Development of Angiopathy of Lower Extremities in Type 2 Diabetes Patients: a Case-control Study. *Middle East Journal of Family Medicine.* 2011;9(6):3-7.
20. GoA. Extract from the Minute of the Government session N 11 of the Republic of Armenia in March 24, 2011 on Approval of the National strategies, implementation

activites and timeline of three diseases with highest mortality rate-- cardiovascular diseases, malignant tumors and diabetes mellitus. In: Armenia TGo, ed March 24, 2011

21. MoH. MInistry of Health order. The Standard on Free Outpatient Health Care Services within the frame of State guaranteed outpatient services.. #131-A; 04 Feb 2011

22. The Minister of Health Order N-1993-A on Approval of the Standard on provision of outpatient services to the population within the frame of The State guaranted free of charge health care services. The MInistry of Health of RA; December 9, 2010.

23. The Minister of Health Order N712 on Approving the Standard on providing free hospital care services within the frame of the State guaranted health care serivces: The Ministry of Health of RA; April 22, 2011.

24. Petrosyan Y. *Prevalence of risk factors for development of angiopathy of lower extremities in Type 2 Diabetes patients: a mixed methods study*. Yerevan: College of Health Science, American University of Armenia; 2009.

25. CHSR/AUA, ASTP. *Armenian Social Transition Program. Manual on health education and healthy lifestyle-for providers and general population.* Yerevan. Armenia.: Center of Health Services Research and Development (CHSR);2002.

26. USAID. *Armenia. Primary Health Care Reform Project. Final Report.*: United States Agency for International Development (UDAID);November, 2010. GHS-I-00-03-00031-00-01

27. The Minister of Health Order N131-A on Approving the Standard of Financing of the State Guaranted Outpatient Services provided at free-of-charge. : The Ministry of Health of RA; Februaury 4, 2011.

28. MoH. Physicians, middle health care personnel, pharmacologists and pharmacists trainings plan for qualifications improvement for 2011. Yerevan: The Ministry of Health (MoH); 2010.

29. Davidyants V. Health Care Human Resources-Phycisians of the Republic of Armenia in 2010. Yerevan: National Information Analytic Center of the National Institue of Health of the Republic of Armenia 2010.

30. NSS. The National Statistical Service of the Republic of Armenia. Statistical Yearbook of Armenia, 2011; http://www.armstat.am/en/?nid=45. Accessed December 5, 2011.

31. Mkrtchyan S. *Availability and accessability of insulin and insulin supplies among insulin dependent patients in Yerevan, Armenia*. Yerevan: College of Health Sciencies, American University of Armenia; 2005.

32. The Minister of Health Order N 74-N on Regulation of provision of free of charge or priviledged condition medicines. The Ministry of Health of RA; January 27, 2009.

33. The Minister of Health Order N 121 on Establishing the procurement, distribution, storage and registration procedures of medicaments and medical products in outpatient health care facilites. Yerevan: The Ministry of Health of RA; January 26, 2007.

34. The Minister of Health Order N 100 on Regulation of medicaments prescriptions issue and release. The Ministry of Health of RA; February 26, 2002.

35. The Chief Specialist of Drug Policy Department. Ministry of Health, Yerevan, November 2, 2011: Personnal communication.

36. MoH. Total health care State budget and its allocations by the types of the health care services. Yerevan: Ministry of Health (MoH); 2011.

37. Marina Harutyunyan, the Head of the Drug Policy Department of the Ministry of Health of the Republic of Armenia. Yerevan 2012; Personnal communication.

38. The Minister of Health Order N79-A on Approving the norms and avarage prices of the State guarated out-patient and in-patient health care and hygiene and anti-epidemic serivces in 2011. The Ministry of Health of RA; January 25, 2011.
39. The Minister of Health Order N859-N on Approving the Norm on Estabilishing the fund of incentive-based financing and incenitve-based payments based on Primary Healh care providers performance indicators, reporting and evaluation of Primary Healh care providers performance assessment indicators. The Ministry of Health of RA; May 10, 2011.
40. The Minister of Health Order N 101-A. on Approving reimbursement standards of employees of the hospitals providing state-guaranteed free medical care and services. The Ministry of Health of RA; January 31, 2010. .
41. The Minister of Health Order N 613-A. on Making amendments in the Order of the Minister of Health N 101-A at 31 January 2011. The Ministry of Health of RA; April 6, 2011.
42. The Minister of Health Order N 314-A on Making amendments in the Minister of Health Order N 101-A at 31 January 2011on Approving Reimbursement Standards of Employees of the Hospitals Providing State-Guaranteed Free Medical Care and Services. The Ministry of Health of RA; February 25, 2011.
43. GoA. The Government Order N 276-N on approivng the Protocol of Medical and Social Analysis. The Government of Armenia (GoA); March, 2006.
44. GoA. The Government of Armenia Decision N780-N on Approving the Standards for provision the disability categories and classifications used for disability confirmation during the medical and social analysis. The Government of Armenia (GoA); June, 2003.
45. PoA. The Law of the Republic of Armenia on the State Pensions N HO-519-N. : The Parliament of Armenia (PoA); January, 2003.
46. GoA. The Government of Armenia Order N 1734-N and (amended in December 2011, N 1860-N) on approving the Defined amount of the basic pension, the cost of one year labor service and the social aid for the funeral ceremony. : The Government of Armenia (GoA); January, 2011.
51. Hermansen; K; Fontaine; P; Kukolja; K; Peterkova; V LG, Gall; MA. . Insulin analogues (insulin detemir and insulin aspart) versus traditional human insulins (NPH insulin and regular human insulin) in basal-bolus therapy for patients with Type 1 diabetes. *Diabetologia.*2004; 47:622-629.
52. Szypowska; A GD, Groele; I, Pańkowska; E. Long-acting insulin analogue detemir compared with NPH insulin in type 1 diabetes: a systematic review and meta-analysis. *Polish Archives of Internal Medicine* 2011; 121(7-8):237-246.

Tables

Table1. Health and wealth indicators for Yerevan and Shirak marz populations, 2005

	Yerevan	Shirak	General Urban	General Rural
Wealth quintiles				
Lowest	0.7	32.6	3.6	47.1
Second	6.8	35.5	12.9	31.8
Middle	20.8	19.7	24.2	12.9
Fourth	30.7	9.2	28.7	5.9
Highest	41.0	3.0	30.7	2.3
Nutrition status in children				
Stunted*, %	17.7	11.1	14.0	11.5
Wasted*, %	4.8	32.6	6.0	3.7
Overweight*, %	3.0	17.6	3.8	4.3
Prevalence of anemia in children	44.7	17.9	37.8	34.6
Prevelance of overweight (BMI≥25) among women aged 15-49	37.3	45.8	40.8	45.2
Prevelance of anemia in women aged 15-49	28.8	26.5	26.9	20.5
Prevelance of hypertension among women aged 15-49	17.1	31.9	21.1	22.8
Prevelance of among men aged 15-49	20.3	24.5	24.7	32.1

Source: Republic of Armenia National Statistical Service, RA Ministry of Health, and IRC Macro. 2006. Armenia *Demographic and Health Survey 2005*.Calverton, Maryland: National Statistical Service, Ministry of Health, and ORC Macro.

Table 2. Characteristics of participants in focus group discussions with providers

Type	**Discussion location**	**Mean age**	**Gender** (F-female, M-male)	**# of participants in a group**	**Mean years of professional experience**	**Mean # of diabetes patients served by one GP**
PHC GPs	Yerevan, regional public polyclinics	48	all F	10	22	105
PHC GPs	Shirak marz, Gyumri city, regional, public polyclinics	47	all F	5	22	35
Endocrinologists working in primary care facilities (polyclinics)	Yerevan. regional public polyclinics	46	all F	9	18	580
Endocrinologists working in primary care facilities (polyclinics)	Shirak marz, Gyumri city, regional public polyclinics	38	all F	5	8	346
Endocrinologists working in hospitals	Yerevan, national private hospital	32	All F	3, one left in the middle	6 years	1-2 patients in a day
Endocrinologists working in hospitals	Yerevan, national public hospital	37	Three-F, one-M	4	11 years	4-5 patient in a day

Table 3. Characteristics of participants in focus group discussions with diabetes patients

Type of diabetes patients	**Discussion location**	**Mean age**	**Gender** (F-female, M-male)	**# of portico-pants in a group**	**Education**	**Mean years of having diabetes**
Type II, mainly with complications	Yerevan, apartment	66	All- F	6	5-high education, 1-secondary specialized	10
Mixed group (type I and II) with complications	Yerevan, AUA building	60	2-M 2-F	4	3-high education, 1-secondary specialized	12 (one of them had type I, the others type II)
Mixed group (type I and II), mainly with complications	Yerevan, National hospital	49	All- F	4, one of them left early	1-high school, 2- secondary specialized, 1-high	13 years (one of them had type I, the others type II)
Type II, mainly with complications	Shirak marz, Shirak village, Village Mayor Office	60	All- F	7	2-incomplete secondary, 2- secondary specialized 2- high education	7 years
Type I	Shirak marz, Gyumri city, public regional polyclinic	35	All- F	6	2- high school education, 4- secondary specialized	11 years
Type II, with complications	Shirak marz, Gyumri city, public regional polyclinic	52	All- F	4	3-school education, 1-secondary specialized	7 years

Table 4. List of in-depth interviews participants

Type of respondent	Gender	Location and level
Policy maker/ Expert	Male	Hospital (private/national)
Policymaker/ Expert	Female	Hospital (private/national)
Policy maker/ Expert	Female	Hospital (public/national)
Policy maker/ Expert	Male	Hospital (private/national)
Policy maker/ Expert	Female	Private medical center/ regional
Policy maker/ Expert	Female	Public facility/regional
Policy maker/ Expert	Female	Public, MoH, national
Policy maker/ Expert	Female	Public, MoH, national
Policy maker/ Expert	Male	Public, MoH, national
Policy maker/ Expert	Male	Public, health department/regional
Policy maker/ Expert	Female	Polyclinic (public/regional)
Provider	Female	Village health center (public/regional)
Provider	Female	Village health center (public/regional)
Provider	Female	Hospital (private/national)
Provider	Female	Hospital (private/national)
Provider	One-male, one-female	Hospitals (private and public/both regional)
Provider	Female	Hospital (public/ regional)
Provider	Male	Hospital (private/ national
Diabetes patient	Male	Hospital (public/regional
Diabetes patient	Female	Patient apartment
Diabetes patient	One- male, one-female	AUA building
Diabetes patient	Female	Patient house
Diabetes patient	Female	Patient house

Table 5. Diabetes morbidity and mortality rates per 100,000 population by age groups[xiv]

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Incidence Age 15 +	96.1	93.8	118.2	112.1	142.6	214.4	227.5	202.5	218.4	237.8	264.9
Prevalence Age 15 +	1331.3	1309.6	1614.1	1603.4	1543.5	1575.8	1607.3	1748.6	1862.5	1907.2	2056.4
Incidence Age 0-14	4.7	5.7	5.1	4.9	7.0	12.2	9.7	8.0	7.6	6.8	7.9
Prevalence Age 0-14	17.8	19.2	26.3	23.0	27.1	32.3	41.6	43.7	41.6	35.3	38.9
Mortality rate	33.3	35.8	47.3	53.29	50.2	48.8	36.3	40.7	40.5	42.4	42.8

Source: *Health and Health Care in Armenia. Annual Statistical Report, 2010*. National Information Analytic Center (NIAC) of the National Institute of Health (NIH) of RA.

[xiv]The National Information Analytic Center provides diabetes morbidity and mortality dataon the country level; it is not disaggregated by Yerevan and marz or by other age categories than mentionedin the table.

Appendices

Appendix 1. Example of a Guide for Key Informant Interview

1. In your opinion is enough attention paid to diabetes as a public health problem in Armenia? How would you assess current health care reforms/ activities in diabetes care? Is it necessary to pay more attention to this problem?

2. Could you describe the legislation, strategies and regulations directly or indirectly relevant to diabetes and chronic diseases (within or outside the health system)? Are there any formal guidelines or protocols on how to prevent and manage diabetes? Give your assessment of the situation. Is Armenia signatory to St. Vincent declaration?

3. What are the most common risk factors for diabetes? Are there any groups that are more at risk, and why? What are your views on the way prevention of diabetes works in Armenia: programs, including screening and education, institutions involved, target groups, mechanisms? What are the obstacles and facilitating factors for effective prevention of diabetes?

4. Who is involved in treatment and follow-up control of diabetes and its complications – within and outside the health system? Who should be involved and in what capacity? How could they be linked within or outside the health system: family physicians, endocrinologists, dispensaries; other specialists, nurses, occupational health staff, the patients themselves, families, schools, civil society organizations?

5. Could you assess the existing physical infrastructure, human resources and capacity in diabetes care in Yerevan and marzes? To what extent each of these are adequate given the need?
   (relevant to both management of diabetes and its complications: conditions, dedicated hospital departments, equipment, drugs and infrastructure in the health facilities; trained specialists specifically for diabetes and complications)

6. How do patients get diagnosed usually? (screening for diabetes/other routine checkups; symptoms…) Where? By whom? What are the positive and negative

factors of this process: geographical, financial, cultural, other, such as lack of time, lack of awareness…?

Could you now tell us how do patients move through the system, once diagnosed? Where, who is involved, what procedures/tests, follow-up etc.? What are the positive and negative aspects?

(probe both for diabetes type I and type II and their complications…)

7. What additional services, if any are offered to diabetic patients with complications and people with diabetes-related disabilities? What are the main constrains for effective diabetes management of these vulnerable groups?

8. How is diabetes care financed (drugs, staff costs, infrastructure, equipment/consumables, insulin etc.)? From what sources (state/international/private)? Are the funds earmarked? How much is spent on diabetes? What are the costs for patients?

9. Assess the way procurement and distribution of insulin and drugs are organized in Armenia? How are these financed? Are there shortages or other problems with this process? Are the patients provided with interrupted supply of drugs?

10. What information is there on diabetes and its complications? How is it collected and managed? Is there a national diabetes registry – how is it run? Data quality? What the information is used for? Is it easy for health providers to access it (e.g. GPs know about people with diabetes in their catchment area)? Are there diabetes passports or carry cards?

11. What has happened in diabetes care since 1991 – positive/ negative? In your opinion, what are the main obstacles for diabetes management in Armenia? Currently what could be done – in short and longer term (in relation to the issues discussed above: infrastructure, HR, capacity, information, changes outside the health system…)?

Appendix 2. In-depth interview guide for diabetes patients

At first let's talk about how you were diagnosed with diabetes.

1. Could you please describe how you were diagnosed with diabetes? What were your first symptoms? How did you decide to seek care? Was it your initiative? How long did the process take until you were diagnosed with diabetes? Did you face any difficulties/delays during this process; why? What was the diagnosis (type of diabetes and complications if any)?

2. Did you have to pay anything directly to providers until your diagnosis was confirmed; if yes,to the provider or to the cashier? How much? For what exactly? [e.g. tests, treatment, hospitalization, to staff, insulin, etc.].

3. What/who helped you through this period [e.g. health professionals, other people, institutions, financial support, social support…]?

Now let's talk about what happened step by step, after being diagnosed with diabetes until now. Where did you go, who treated you, for how long, as far as you could remember? Please describe this separately for diabetes and any complications you might have.

4. Where did you seek care after being diagnosed with diabetes? What was the treatment that was first prescribed [probes: insulin, sugar lowering drugs, procedures, lifestyle changes…]? Was the treatment subsequently changed – in what way?

5. After your diagnosis was confirmed, how often are you asked to come to the health facility and in what cases? Have you got a particular doctor (endocrinologist) who is mainly looking after you? Do you always return to him/her? In what cases do you go to see him/her? [for follow-up; to bring test results; to ask questions…] How helpful is he/she? Do you make any payments to him/her during your visits? If yes, how much?

6. Who is monitoring your blood sugar? Where? Do you have a glucometer and test strips? Do you know how to monitor your blood glucose level?
   What is the role of your GP or primary health care provider in your diabetes control?

7. Has anybody assessed your feet, eyes, or other organs (for complications)? Who did that? How often is it done currently? Do you make any payments for those check-ups?

8. Do you suffer from other chronic conditions in addition to diabetes? What are they? Have you ever seen a specialist specifically for your complication/s if any? Did you need a referral? Did you have to pay out of pocket for seeing a specialist? How much and for what services?

9. Have you had surgery or another medical intervention requiring hospitalization for diabetes complications? Please tell us about it. What are the consequences?

10. Usually, where do you get your insulin/ diabetic drugs? Do you have to pay for it? If yes, usually how much per month? Are there shortages of insulin or other diabetic drugs? Have you ever had delays in obtaining insulin, drugs and consumables [how long, what was the case?]. What other problems do you usually face regarding insulin and drugs consumption?

11. Would you say it was easy or difficult to follow the prescribed treatment? In your view, is your condition (incl. complications) well under control? In your opinion how effective is your current treatment?

12. Please tell us how are you managing in your daily life? What were the implications of diabetes and its complications on your life? [probes: financial, social activities, education, profession, employment, choice of lifestyle…] Apart from getting treatment and drugs, what could be done to make life of people suffering from diabetes easier? [in prevention, in diagnosis, in treatment]. Are there any changes that need to be made outside the health care system?

13. Do you know what rights you have as a person living with diabetes? [explore rights to free healthcare, insulin, drugs, social benefits…]? Could you list any benefits you get in reality [pensions, benefits, telephones, housing…]? Where do you get them? What is the procedure?

14. How much did you know about diabetes before your diagnosis? What were your information sources, at the time and now? To what extent have you been kept informed about your treatment? By whom? Did you understand at the time what is happening at each stage? Do you understand it better now? Are there things that you still don't understand?

Some general questions about diabetes and we will finish the discussion.

15. Could diabetes be managed effectively nowadays? What are the necessary conditions for effective management of diabetes (for type I and II)? What happens in reality?

16. Since independence have there been any changes in the care that people with diabetes receive? How would you assess these changes? Any other changes in the way this people live?