

Navigating the health system: diabetes care in Georgia

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Background Effective delivery of diabetes care requires integration across specialist teams delivering recognized interventions, a reliable pharmaceutical supply, and promoting self-management. Drawing on a framework incorporating physical, human, intellectual and social resources, the paper examines how these challenges are managed in diabetes care in Georgia.

Methods The rapid appraisal study triangulated data from interviews with users, providers and key informants from various institutions in four regions of Georgia; data on clinical and social outcomes from diabetes; legislative and policy documents.

Results Diabetes-related mortality in Georgia is among the worst in Europe and Central Asia, in a context of conflict, economic collapse and weak institutions. Essential inputs for diabetes care are in place (free insulin, training for primary care physicians, financed package of care), but constraints within the system hamper the delivery of accessible and affordable care. There are no evidence-based guidelines on diabetes management, formal support and quality assurance. The scope of work of primary care practitioners is limited and they rarely diagnose and manage diabetes, which instead takes place within the vertical system.

Access to insulin is problematic in rural areas. Obtaining syringes, supplies and hypoglycemic drugs and self-monitoring equipment remains difficult everywhere. Prevention and effective management of complications is limited, increasing adverse outcomes. Diagnosis and treatment of diabetes complications involve hospital admission and unaffordable out-of-pocket payments.

The complexity of pathways to key stages of care obstructs continuous care. There are poor linkages between primary and secondary care and ineffective patient follow-up or monitoring of outcomes. There is little effort to promote self-care, adherence to drug regimens and appropriate lifestyle, or to empower patients.

Conclusions Improving diabetes outcomes will involve simplifying pathways to care and drugs, reassessing staff roles and insulin distribution systems. This would

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require better co-ordination of the inputs into the system and development of an integrated and patient-centred model.

Keywords Georgia, diabetes management, rapid appraisal

KEY MESSAGES

- In Georgia, while many essential inputs for diabetes care are in place, constraints within the health system hamper the delivery of accessible and affordable diabetes care.
- To improve diabetes outcomes, pathways to care and drugs need to be simplified, and staff roles and insulin distribution systems reassessed.
- Better co-ordination of the inputs into the system, and development of an integrated and patient-centred model, are required.
- Although the study focuses on diabetes, many of the system constraints identified will also apply to other complex chronic diseases.

Introduction

Diabetes mellitus was once seen as a problem limited to high-income countries but this is no longer the case (Jamison *et al.* 2006). In poor countries, children afflicted with Type 1 diabetes are now surviving, at least into young adulthood, while life-style changes, especially in urban settings, are fuelling a rapid increase in Type 2 diabetes among older people.

At an individual level, the management of someone with diabetes should be straightforward. Insulin has been available for over 80 years, it is off-patent, and its mechanism of action is well understood. Oral hypoglycaemic drugs used in Type 2 diabetes are also cheap and easily available. Effective treatments are also available for many of the complications of diabetes. Yet the reality is somewhat different. Even among high-income countries, rates of premature death vary considerably, with high levels in countries with poorly co-ordinated, fragmented systems (Matsushima *et al.* 1997; Nolte *et al.* 2006). The problems are particularly acute where functioning health systems that once enabled people with diabetes to survive have broken down. Thus, deaths among young people with Type 1 diabetes have increased markedly in many former Soviet Republics since the late 1980s. Research in Ukraine demonstrated that this was a direct consequence of health care failings, with erratic insulin supplies being a major factor (Telishevska *et al.* 2001), while research in Kyrgyzstan showed, in addition, the consequences of policies unsupported by evidence and patient disempowerment (Hopkinson *et al.* 2004).

The principles of good diabetes management are widely agreed. They are set out in the St. Vincent declaration (WHO 1989) and operationalized in numerous national and international guidance documents (American Diabetes Association 2003; Department of Health 2003; Population Health and Wellness 2003). The Chronic Care Model also offers an approach to management of diabetes and other chronic diseases (Bodenheimer *et al.* 2002; WHO 2002; WHO 2005). All of these documents emphasize the need for evidence-based care, responsiveness to needs, self-management and empowerment (Fisher *et al.* 2005; Glasgow *et al.* 2005), and integrated care (Ouwens *et al.* 2005). Some also identify stewardship,

in various guises, as a means of facilitating effective care (Laxminarayan *et al.* 2006).

This paper examines the management of diabetes in Georgia, a country that until recently had a health system that provided care of reasonable quality to its population but now has among the highest rates of diabetes-related mortality in the former Soviet Union. It offers a lens through which to identify the problems that beset those among the Georgian population in need of care for any complex chronic disease.

Setting

Georgia lies in the southern Caucasus and has an estimated population of 4.4 million (2006, State Department of Statistics). During the Soviet era it was relatively prosperous but, since independence in 1991, economic crises and civil war have led to a drastic reduction in public revenue; real per capita public expenditure on health fell from US\$13 to less than a dollar between 1990 and 1994 (Gamkrelidze *et al.* 2002). As a result, informal payments are widespread and many people fail to seek care when in need (Balabanova *et al.* 2004).

During the Soviet period, Georgia had the 'Semashko' system that was in place throughout the USSR. Hierarchical, centrally planned and financed from general government revenues, it provided care that was, formally, free at the point of use, although even then informal payments were not uncommon. The system was resource intensive, but facilities were poorly equipped and professionals were isolated from international developments. However, patients with diabetes did receive free care through a system of specialist dispensaries. In 1995 a radical reform of the health sector was instituted, based on the introduction of health insurance, some formalization of out-of-pocket payment, and the introduction of family practice.

Methods

The study sought to identify the extent to which health system requirements for effective diabetes control are in place

in Georgia. It is based on a conceptual model that combines Pawson and Tilley's method of realistic evaluation of complex social systems, in which 'context + mechanism = outcome' (Pawson *et al.* 1997; Pawson *et al.* 2005), with a framework developed initially to understand the pre-requisites for well-functioning hospitals, which envisages a need for co-ordinated investment in physical resources (here pharmaceuticals and testing equipment), human resources (trained staff and empowered patients), intellectual resources (evidence and means of implementing it), and social resources (patient support systems) (McKee *et al.* 2002) (Figure 1). In essence, there are certain inputs that are essential for a functioning system of care, and these inputs need to be coordinated (through 'mechanisms and processes') and adapted to the particular context in order to improve outcomes.

The model informed the design of the study, providing a structured process by which to identify critical weaknesses in the management of diabetes and its complications, and subsequently to identify policy options that offer the possibility of improving diabetes care and will be feasible in the Georgian context. Recognizing the importance of context, no individual model of care was proposed in advance but it was determined that whatever was provided should be informed by the principles set out in the St. Vincent declaration and the common elements of guidelines arising within the established models discussed above.

Data collection employed a rapid appraisal approach, taking as a starting point the experiences of users and frontline health care providers while further developing instruments used previously by the authors in Ukraine, Kyrgyzstan and Kazakhstan. It was also informed by work in other settings (Anderson *et al.* 2003; Beran *et al.* 2005) and by tools for assessment of HIV (Atun *et al.* 2005) and tuberculosis policy (Coker *et al.* 2005).

The rapid appraisal process involved collection and triangulation of multiple data sources, including internationally available sources, facility-level and national statistics, legislative, regulatory and policy documents related to diabetes care, and information on patient outcomes (medical and social). Interviews with key informants and observation of processes of care were undertaken in Tbilisi, Mtskheta, Kakheti and Kvemo kartli regions in March and April 2006 (Figure 2). Key informants were identified by snowball sampling to include a range of health care providers (14 interviews) and other stakeholders from government, academia and the health system management (12) with a detailed knowledge of how the system for diabetes care works in practice. All levels of care were represented, from primary (urban polyclinics, family medicine centres and remote rural ambulatories), through secondary (hospitals, specialist dispensaries, emergency services) to regional and national institutions financing and delivering diabetes care and social services. Ten adults with Type 1 diabetes were also interviewed. They were recruited from among those attending the main hospital in Tbilisi and were selected purposefully to include individuals from all parts of Georgia.

Interviews were conducted in Georgian or Russian by four of the authors of this paper (NK, IC, KG, TK), all of whom had been involved in the study design, including reviews of relevant literature on both diabetes and rapid appraisal. They are all medically qualified and, although now working in

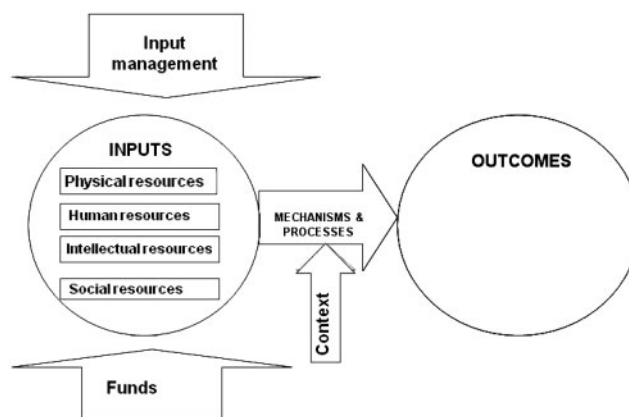


Figure 1 A framework for chronic disease management



Figure 2 Map of Georgia showing study regions

public health, had experience of managing diabetes during their medical training. The interviews with physicians were semi-structured, based on an interview guide, whereas the interviews with policy makers were less structured, reflecting their diverse perspectives, drawing on the conceptual framework of different types of resources, while allowing key themes to emerge. Interviews with patients were also less structured, allowing them to describe their personal experiences, but again informed by the different types of resources required for high quality care and their interlinkages. Informed consent was obtained prior to the interviews and efforts were made to ensure confidentiality. Routine practice was observed during the visits to health facilities.

Data were transcribed and analysed thematically. The approach taken involved two steps. The first was deductive analysis, coding units of data according to key inputs and other elements of the theoretical framework which informed study design. This was followed by an inductive analysis, seeking to elicit new themes or unexpected findings through coding and categorizing, according to grounded theory (Strauss and Corbin 1990). Analysis was conducted independently by two of the authors to increase validity.

Results

Epidemiological trends in diabetes in Georgia

Data on mortality attributed to diabetes at older ages is difficult to interpret because of the frequent presence of

co-existing disease. Consequently, the following discussion is limited to deaths under the age of 65. The age-standardized death rate increased threefold between 1985 (2.9 per 100 000) and 1995 (8.8 per 100 000), after which it recovered somewhat, to 5.1 per 100 000 in 2001 (WHO 2007). This compares with the average of 2.7 per 100 000 in the 15 pre-2004 European Union countries.

A diabetes register covers those with Type 1 diabetes. In addition, aggregate data on patients with both types of diabetes are collected at health facilities and transmitted to the Ministry of Labour, Health and Social Affairs (MoLHSA). These data suggest a relatively constant prevalence of Type 1 diabetes between 1996 and 2004, at about 320 per 100 000 population, and an increase in the prevalence of Type 2 diabetes from 680 to 838 during the same period. Interviewees suggested that this was a relatively accurate estimate for Type 1 diabetes but an underestimate for Type 2 diabetes.

Resource inputs

Physical resources

During the Soviet period, the endocrinology outpatient dispensaries provided most care and follow-up to people with diabetes, while hospital departments mainly treated complications. Following recent reforms, the role of the dispensaries has largely been assumed by two new non-governmental diabetic associations, providing care for children and adults, respectively. Both are linked closely to specialized hospitals in the capital, with care delivered by hospital specialists. The Diabetic Children Protection Association has two field offices in the western part of Georgia, while the V. Ivereli Georgian Society of Endocrinologists has six field offices throughout the country. The associations are contracted by the State United Social Insurance Fund (SUSIF) and their funding and accountability are quite distinct from the hospitals with which they are co-located. In addition, there are some private endocrinology clinics in urban areas offering care on a fee-for-service basis.

Another essential input is a supply of insulin and related pharmaceuticals. During the Soviet era, insulin supply was centrally organized and distributed free of charge by the Georgian government. Between 1991 and 1994, when the health system effectively collapsed, insulin was provided as part of a series of packages of humanitarian aid, mainly from the U.S. State Department and the European Union. By 1994, the Ministry of Health was once again able to procure insulin from the state budget, purchasing animal insulin 'Lechiva' and distributing it through the policlinics to adult patients. Supplies improved further in 1995, when human insulin was procured from Novo Nordisk, but only for children.

In 1999, responsibility for procurement and distribution of insulin was transferred to the newly established insurance fund. In 2001 it began purchasing human insulin for adults following a concerted campaign by patients against animal insulin. However, the amounts purchased were much less than was needed. One problem was that patients who had been purchasing human insulin in markets now sought to obtain it from public sources. Another, as noted above, was that some patients were registered at several policlinics; they could obtain more than they needed and free insulin soon appeared on the

black market, not only in Georgia but also in neighbouring Azerbaijan and Armenia.

In response, the insurer established a register of those with Type 1 diabetes; those on the register were entitled to three vials (two vials of insulatard + one vial of actrapid) per month (although for some people this was insufficient). In addition, to control leakage from the system, the right to prescribe for adults was withdrawn from the policlinics and transferred to the Georgian Society of Endocrinologists. The insurance fund has also established a new mechanism to store and distribute insulin, inviting tenders from local pharmaceutical companies. Consequently, free insulin and related supplies for adults are supplied via pharmacies, located throughout the country, with vials marked to designate that they were supplied free.

The adult association has a contract to supply oral hypoglycaemic drugs. Patients with Type 2 diabetes who shift from insulin to drug therapy receive the first 6 months' supply free.

Supplies for children are funded by the state and distributed through the children's association. Patients must attend one of the association's three offices each quarter to obtain insulin and related supplies. Those aged under 21 are given insulin pens and glucose test strips and all those under 25 are given modern 'AccuCheck' glucometers and lancets.

Human resources

Few of the licensed primary care physicians working in outpatient clinics have received training in modern diabetes management and most patients are referred to a policlinic specialist, or to an association. Under the new reforms, each endocrinologist is required to complete a 3 month course followed by certification exams every 5 years. This may also involve short courses on care for diabetes-related foot and eye complications, which contribute to certification. However, only 124 endocrinologists completed retraining between 2001 and 2005, partly due to limited educational capacity and the high cost of training, with only 46% of those now in post having done so.

Most endocrinologists work in policlinics (173) and are responsible for the initial diagnosis (measuring blood glucose) and subsequent referral to the associations. They cannot prescribe insulin or determine the insulin regimen. The 79 hospital endocrinologists working for the associations confirm the diagnoses, provide support for self-care, and prescribe insulin. Although patients return to policlinic endocrinologists for further advice and monthly renewal of prescriptions, only tertiary-level endocrinologists can modify the treatment regimens. Some hospital endocrinologists, however, do treat complications of diabetes and other endocrine diseases. Insulin can also be prescribed in the private sector.

Effective diabetes management also requires informed patients who are empowered to take control of their condition. In 1995 the children's association established a system of classes and summer camps for children and their parents (Koplatadze *et al.* 2003). Endocrinologists interviewed reported training adult patients in self-care, diet and foot care where possible, but no educational materials were found at health care facilities. Training in practical skills for diabetes management for adults is only provided by a few private clinics. Among the most serious constraints facing patients seeking to self-care is the cost of

self-monitoring equipment. Although supplied free to children, adults must pay 200–400 GeL (US\$100–200). Only one person among the 10 patients interviewed was able to afford one:

“I’m not provided with a glucometer and I can’t afford to buy it as it is very expensive. I have to go to the policlinic every time when I do not feel well. I pay for every visit to the physician in the polyclinic.” (women, 42, Tbilisi)

Intellectual resources

During the Soviet period, all medical guidelines were developed in Moscow, and Georgia, like other republics, had no mechanism to replace this system. The diabetes associations have since taken the lead in developing modern national guidelines. Thus, the adult care association has published guidance on management of both types of diabetes. The MoLHSA has established a board of experts to review and authorize guidelines developed by professional associations. Its initial focus was on primary care, however, and it had not therefore been able to assess the diabetes guidelines. Thus, in reality most physicians rely on out-of-date textbooks, advertising materials distributed by pharmaceutical companies, and informal advice that is not always supported by evidence.

“We don’t have any guidelines for diabetes management. Usually, we learn about new methods of treatment at the conferences and seminars for endocrinologists, from handouts that are distributed. We share them with other physicians who did not participate in the events. I also have friends in Moscow who time to time send me some medical journals and books.” (policlinic endocrinologist)

Social resources

During the Soviet period, patients with both types of diabetes were eligible for a complex package of state allowances. Currently, patients with different degrees of disability (classified as ‘significant’ or ‘severe’) receive pensions of 28 GeL (US\$14) or 35 GeL (US\$17.5), respectively, while those with ‘mild’ disability receive no pension. Eligibility is assessed directly by a policlinic or a specialized clinic replacing the earlier procedure of administrative units granting disability status, which was seen as corrupt and cumbersome.

Until 2007 patients with severe forms of Type 1 and Type 2 diabetes automatically received ‘significant disability’ status, subject to annual reconfirmation after the initial diagnosis, and with the status becoming permanent after 5 years. In cases of amputation or severe eyesight problems, permanent disability status is granted immediately after diagnosis. However, Type 2 diabetes has recently been removed from the list of conditions carrying a pension entitlement, which endocrinologists believe will impair the affordability of hypoglycaemic drugs. This group has a high rate of complications incurring extra costs and, for most, the disability supplement was the only source of funds for drugs.

Once a child under 18 is diagnosed with diabetes, he or she automatically receives disability status and is eligible for a monthly pension of 28 GeL (US\$14), with an additional 7 GeL (US\$3.5) for a carer, which is low compared with the average cash income per capita of 60 GeL (2005, the State Department of Statistics). In Tbilisi, those with disability are also

exempted from gas and water charges under a municipally funded programme. However, most people registered with a disability are not allowed to work in the public sector, with no targeted social security programmes to protect their income.

Mechanisms and processes

The policy framework

The state’s responsibilities in relation to diabetes and patients’ rights to treatment have been legally defined. The Law on Health Care sets out the obligations of the state with regard to people requiring permanent replacement therapy (suffering from diabetes, cancer and other diseases). The state guarantees these patients vitally important medications, emergency medical care related to their disease, and physical, psychological and social rehabilitation (Parliament of Georgia 1997). The Georgian National Health Policy, adopted in 1999, is a 10-year programme containing targets for improving population health (Government of Georgia 1999). It emphasizes generic risk factors for non-communicable diseases and promotion of healthy life-styles, while noting the importance of preventing ‘socially dangerous chronic diseases’ (including diabetes). The Strategic Health Plan for Georgia, prepared by the MoLHSA (Government of Georgia 2000), identified chronic disease as a major health problem:

“Limited access to quality services caused deterioration in the health of the nation that is exacerbated by an ageing population. Georgia is now faced by a double burden of chronic non-communicable diseases, mainly of middle age and the elderly, accompanied by the re-emergence of infectious diseases such as tuberculosis and diphtheria.”

People with diabetes are also targeted by reform initiatives that followed the 2003 Rose Revolution, such as channelling government funds to protect the poor from catastrophic health expenditure, strengthening of primary care, and increasing the role of private insurance companies.

Models of delivery and health seeking behaviour

The route followed by patients from their first contact with the system prior to diagnosis of Type 1 diabetes until the point at which they obtain free insulin involves multiple steps (Figure 3). Policlinic endocrinologists refer newly diagnosed patients or those requiring adjustment of their insulin dosage to the respective association for expert assessment. Following a 3-day in-patient assessment, newly diagnosed patients are sent to one of the regional offices of the State United Social Insurance Fund to be issued with an individual policy document, which, as noted above, must be revalidated each year. The patient must then return to the referring policlinic endocrinologist and present the validated policy in order to obtain a prescription. The patient then takes the prescription, along with the policy, to the designated pharmacy to obtain their monthly free insulin supply.

Following their entry into the system, adults with diabetes obtain further prescriptions from a policlinic specialist each month as long as the insulin regimen is unchanged. In the event of complications, the policlinic endocrinologist refers the patient to other policlinic specialists, or to a specialist clinic (e.g. ophthalmology clinic, sepsis centre for diabetic foot) in the

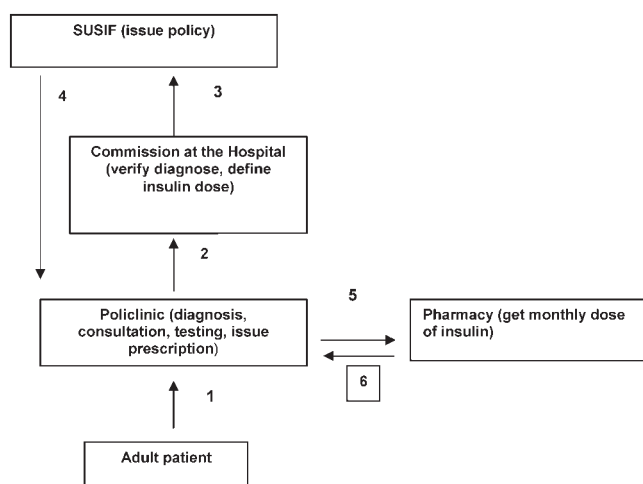


Figure 3 Formal pathway followed by patients over 18, with type-1 diabetes

public or private sector. The patient chooses where to go based on personal preferences, anticipated cost of obtaining care, and perceptions of quality. Typically, a patient visits a specialist in relation to diabetes or its complications from once a month to twice a year.

Children suspected of or diagnosed with diabetes are referred to the endocrinology department of Tbilisi Children's hospital (Figure 4). The child is hospitalized for 2 weeks, investigated according to an agreed protocol and the appropriate dosage of insulin is established. After discharge, patients are referred to the children's association's central office in Tbilisi, where they are registered, provided with monitoring equipment, an insulin pen and a 3-month supply of insulin. The child and their parents receive training in self-care. Every 3 months the child is required to return to the association's central or regional branches for laboratory tests to identify any early complications. The association has a well-equipped ophthalmology facility at which children are checked for eye problems twice a year, with fundus photography and retention of images to facilitate follow-up. In case of complications, children with diabetes are referred to specialist clinics funded by the government. Treatment for all other co-morbidities in children with diabetes is also free in the Children's Hospital in Tbilisi.

From a patient's perspective, especially for adults, entry to and navigation through the system is somewhat complicated. Newly diagnosed patients must wait several days before they actually obtain free insulin. During this period, they must buy insulin and related supplies themselves, and their treatment is often disrupted. This situation is improved once the patient is in the system. Further management requires monthly visits to the polyclinic and a pharmacy in the district centre.

"When I was told for the first time that I had diabetes I was very scared and didn't know what to do. The endocrinologist in the polyclinic sent me to the hospital in Tbilisi where I stayed for three days. After that I returned to the polyclinic with a prescription from the hospital doctor. The endocrinologist at the polyclinic gave me a different prescription and said to go to the insurance company in Tbilisi. At the insurance company I was given a document to show at the pharmacy. It took me about five days before I obtained

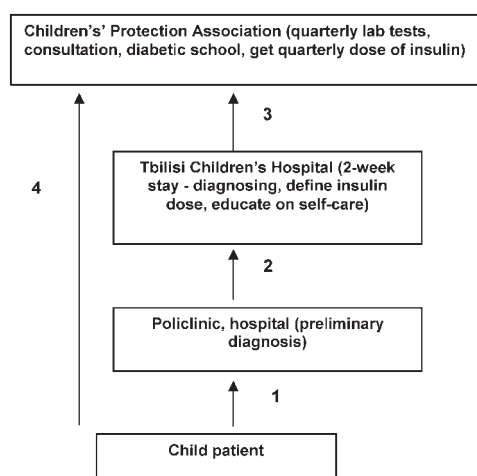


Figure 4 Formal pathway followed by child (0-18) with diabetes

insulin. During this period I had to buy insulin myself – it was a problem for me because insulin is expensive in Georgia."

Interviewees reported how the new system to supply state-funded insulin in pharmacies is more reliable and has virtually eliminated the black market. However, for people in some rural areas, regular access to the pharmacies in the district town may be a burden.

"I have been suffering with diabetes since 1991. Before I had to buy everything: insulin, syringes, test strips. Nowadays it is better as insulin is available in the pharmacies. But I live in a village and the closest pharmacy providing free insulin is in the district centre."

A striking finding was the low expectations of those interviewed, even allowing for the scarcity of resources available to the health sector and the level of economic development. There was an acceptance that it would take 6–7 visits to different locations to obtain free insulin. Although, when looked at from a system-wide perspective, it seemed obvious that complex pathways to care, fragmentation of care and uncertainty about costs create a major obstacle to continuing care, this was accepted by many respondents, both patients and professionals, as inevitable.

Development of family medicine is a key reform initiative in Georgia. Trained family physicians are expected to manage diabetes based on modern guidelines and support self management. The model aims to create a 'gatekeeper' function, facilitating integration with secondary care. However, most interviewees recognized that this vision is proving difficult to implement and many of the initial trainees revert to their former practices when they return to polyclinics.

Models of financing

In theory, since 1995, basic health care (primary and essential hospital care) has been covered by the state-funded programmes through new public financial intermediaries at the national level (SUSIF) and municipal levels (currently abolished), and for preventive health activities, from central government sources. The state guarantees limited services, with

co-payments for some of these, and official fees at the point of use for services not covered by the state. Formal and informal out-of-pocket payments constitute a large part of total health care expenditures (74.7% in 2003; WHO 2006). Care is formally free for people with many chronic diseases, especially for groups defined as vulnerable (children under 15, adults over 65, and people living in isolated rural areas). Patients with diabetes are entitled to a certain number of laboratory tests (e.g. six blood glucose tests), but face no restrictions on the number of subsequent contacts with specialists if they are referred by a primary care physician. The programme also covers pharmaceutical procurement and distribution as well as establishing treatment regimens. Yet in practice, all patients interviewed incurred various costs. Regulations are not implemented uniformly or are disregarded. This is particularly the case in remote areas where controls may be less strict. Most patients reported paying formally or informally for each visit to the district physician.

There is considerable confusion among health professionals about precise entitlements. Interviews with family physicians and polyclinic endocrinologists revealed that few were familiar with the State guarantees for people with diabetes. Thus, some charged for blood tests in excess of those included in the basic package while others did not. Patients typically paid 5 GeL (US\$2.5) for each visit to a specialist, although this varied among facilities, with one polyclinic reducing the fee to 2 GeL (US\$1) per visit, which was considered more affordable. Endocrinologists also report that some patients are unable to pay fees and, in such cases, they provide free consultations.

While insulin is free, associated supplies, such as syringes and test strips, are not. Neither are oral hypoglycaemic drugs, with a monthly supply of basic drugs costing from 10–12 GeL (US\$6), to 60–70 GeL (US\$30–35), or between 30% and 200% of the monthly pension for those with severe disability. Consequently, interviewees reported that Type 2 diabetes patients with low income cannot afford to buy them. Such patients tended to shift to free insulin therapy instead.

Management of complications, such as diabetic retinopathy, neuropathy or leg ulcers, incurs considerable additional costs. For example, the treatment of a diabetic ulcer at a sepsis centre may cost from 800 GeL (US\$400) up to 3000 GeL (US\$1500) [the average monthly salary is 204 GeL (US\$113)]. Given that, for most patients, these payments are unaffordable, amputation is the less costly 'solution' to the problem.

Emergency care is provided free of charge, but treatment of hypoglycaemic or ketoacidotic coma in intensive care units is subject to co-payment (25% of the total price), with only 3 days hospital stay and only some specific tests and medications reimbursed. However, intensive care physicians report that many patients have to stay longer and have to pay directly for procedures not covered by the state. According to the head of the Intensive Care Unit in the Republican Hospital, about 40% of patients are unable to pay even the co-payments under the state programmes. Other research suggests that out-of-pocket payments place significant burden on households, especially for the poor (Gotsadze *et al.* 2005). The out-of-pocket expenditures associated with hospital treatment burden both rich and poor households, and contribute to transitional poverty (Gotsadze *et al.* 2005).

The deterrent effect of hospital charges is illustrated by the low hospitalization rates. In 2004, the Tbilisi ambulance service recorded 1273 cases of diabetic coma (the majority hypoglycaemic) among adults, and 4 cases among children, yet only 185 patients (15%) were hospitalized. Ambulance physicians reported that relatives of patients, especially those with low incomes, opt for management at home once the patient has been stabilized.

Current reforms, as mentioned above, envisage a state-funded supplemental package for the poor. However, the targeting exercise does not cover population groups who may become poor as a result of paying for needed health services, for example the chronically ill and elderly.

Discussion

The health system in Georgia has faced substantial problems following independence. The inherited infrastructure was unaffordable and poorly suited to the health challenges arising in the 1990s. In the immediate aftermath of independence, people with diabetes were sustained only by international donations and their own savings. Subsequent reforms have sought to put in place a system that, if working more effectively, could make life much easier for patients with diabetes. The situation for children with diabetes can be seen to be improving already. However, as is often the case, there is a gap between the rhetoric and the reality.

The conceptual framework underpinning this paper provides a means of identifying the weaknesses in the current system. Turning first to human resources, there are sufficient numbers of medical professionals potentially available to provide care for diabetes. However, many have become deskilled due to persisting vertical organization of service delivery and have little opportunity to exercise independent judgement, especially in relation to insulin regimens. Polyclinics act simply as referral points from which patients are referred to specialists working in the specialized diabetic associations. This means that referring physicians act essentially as administrators, authorizing prescriptions for regimes determined elsewhere, rather than supporting patients in managing their complex condition.

The main concerns about physical resources relate to pharmaceuticals and disposables. Much has been done to improve access to insulin, which is now fully financed by the government and free at the point of use. The move from a centrally controlled insulin distribution requiring multiple visits at different levels of the health system to district-based distribution through pharmacies is beneficial overall. Yet insulin is of no use on its own, and adults with diabetes and on insulin are not provided with free syringes or related supplies or with hypoglycaemic drugs. Consequently, there are significant financial barriers to enabling continuing supply, so increasing the risk of complications.

There is also an inadequate supply of what we have termed intellectual resources. Most physicians reported acquiring their knowledge at university, with subsequent learning from informal communication with colleagues or occasional attendance of conferences and seminars. Few can access recognized sources of high quality evidence or formal support. Interventions known to be effective, such as specialised

programmes to prevent diabetic foot disease or screening of adults for retinopathy, do not exist.

Social resources do provide much needed support for patients with diabetes, but like most others receiving disability benefits, they are stigmatized and excluded from public sector employment.

The conceptual framework also highlights weaknesses in the mechanisms of obtaining care, as well as the specific contextual influences. In Georgia, diabetes is commonly diagnosed by means of a process that involves admitting patients to hospitals. This is inconsistent with international practice as it is clinically unnecessary, costly and has the effect of stigmatizing the patient, with a very similar situation observed in Kyrgyzstan (Hopkinson *et al.* 2004). In addition, the costs that would be incurred by patients admitted for complications renders such care essentially unaffordable. Unless this is changed, together with a substantial redefinition of task profiles, simplified procedures and consistent support for first-level endocrinologists, there will be few benefits from investing money in the training of family physicians and endocrinologists in outpatient facilities.

This study confirms that the ubiquitous and extensive out-of-pocket payments in Georgia (Skarbinski *et al.* 2002; Belli *et al.* 2004) are especially threatening to those with chronic diseases who need uninterrupted treatment regimes, confounding efforts to ensure free access to care. It also highlights the poor linkages between different levels of care, with no effective mechanisms for co-ordinated follow-up, disrupting continuity of care. Lack of mechanisms for information exchange between providers at different levels means that patients must manage the process themselves. Yet while patients with diabetes in western countries contribute considerably to management of their disorder, in Georgia this is difficult because of lack of access to affordable self-monitoring equipment. Furthermore, there is little effort to inform adult patients and provide them with skills to self-care or to adhere to an appropriate diet, apart from occasional advice by endocrinologists during visits to facilities.

The findings highlight the value of the 'input-mechanisms-output' conceptual framework. International comparisons of health system performance often focus on inputs alone, reflecting the availability of data (Nolte *et al.* 2005). The Georgian government has invested considerably in regulating the system for diabetes care, and many of the essential inputs are already in place (free insulin, a guaranteed package of care) and some will soon be added (primary care physicians trained to manage diabetes, subsidies for poor groups). However, these inputs are not coordinated and often fail to achieve their intended effects.

Investment in care for chronic conditions is taking place in the context of ongoing comprehensive reform of the financing and delivery of care aiming to promote more accessible, affordable and good quality services. At the same time, Soviet-style institutional arrangements, processes of care and clinical practices persist, thus complicating reform implementation. This is especially evident in the limited patient participation in the decisions concerning their own care.

The situation in Georgia resonates closely with what is seen in other former Soviet countries (Telishevska *et al.* 2001; Hopkinson *et al.* 2004; Rese *et al.* 2005). Most countries have

embarked on ambitious health system reforms, emphasizing primary care, purchasing and contracting of care according to needs, competitive drug procurement and distribution, and reform of social protection systems. However, reforms have often invested in isolated components of the system, with little attention to how they mesh with other parts. For example, many primary care physicians have been trained but this has not been accompanied by investment in infrastructure and basic resources, or changed referral patterns that would allow the newly trained professionals to provide effective care for diseases such as diabetes and its complications. There are particular challenges in getting historically hierarchical health systems based on vertical models of care to provide the complex response needed for diabetes.

As in other former Soviet countries, Georgian reforms have rarely taken account of patients' interests (especially where chronic diseases require long-term care) and they have uniformly relied on direct out-of-pocket payments which obstruct access to care (Lewis 2002). The application of the framework proposed here offers an alternative, as it places the users and providers at the centre of the system, providing a starting point from which to explore the continuum of care and to identify the inputs required at each stage.

A number of policy options emerge from this work that could improve diabetes management in Georgia. First, the roles of health professionals at all levels could be reassessed. Second, the funding system could recognize that people with diabetes also need syringes, needles and testing kits or hypoglycaemic drugs. A consensus on clinical guidelines for diagnosis and treatment of diabetes accompanied by a system of quality assurance would facilitate implementation of internationally recognized practices, which should be linked to the state-guaranteed package. However, the most important implication of this study is the need for a comprehensive approach that tackles all of the interlinked elements of care and seeks to strengthen integration of diabetes care. Retraining will be futile if those trained are prevented from applying their expertise by regulations or by a lack of equipment. Pathways to care for people with diabetes could be simplified considerably, enabling people with diabetes to self-care, including adherence to effective treatment; healthy diet and life style; and prevention of complications. Improving monitoring of needs and clinical and social outcomes, such as employment and socio-economic status, is also important.

Although this study is about diabetes, many of the constraints imposed by the system will apply equally, or even more so, to patients with any complex chronic disease (Nolte *et al.* 2006). Diabetes simply provides a useful lens through which to assess much of the overall system.

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