

APPENDIX 3

Challenges of Design and Implementation: Three Country Cases

This appendix focuses on three case studies from Indonesia, Georgia, and India that offer specific country examples of issues related to non-communicable diseases (NCDs) as a complement to some of the more conceptual discussions earlier in this report. The issues raised are not intended to be exhaustive, but rather illustrative of some of the challenges that health systems must contend with in the “real world” of preventing and controlling NCDs, particularly with respect to service delivery.

A common theme in the three case studies is insight into the important question of what makes NCDs different. Understanding the special features of NCDs, especially as they pertain to service delivery, can represent a valuable first step toward informed decision making related to NCDs. This will become even more true as the epidemiological transition unfolds in many countries around the world. The appendix also addresses what makes NCDs the same as other health challenges. This is important from the point of view of integrated approaches to health service delivery.

As noted, this set of case studies is not intended to be an exhaustive discussion of service delivery. Such an exercise is beyond the scope of this report and is the subject of an ongoing, multiyear work program at the World Bank. This appendix is intended to raise a number of questions of interest to senior analysts and policy advisers and to provide some ideas for further exploration.

The following summarizes some of the key messages from each country study with an emphasis on what makes NCDs different:

- The Indonesia case study highlights issues related to the volume and composition of NCD services during the epidemiological transition. As chronic diseases, NCDs require sustained contacts with the health system, and they also have a greater bias toward inpatient, hospital care. Thus, a disease burden that is shifting from communicable diseases toward NCDs implies greater pressures on health services in general, and on inpatient services in particular. Preparing for changing patterns in the volume and composition of service delivery should be a policy priority. In this context, early emphasis on primary care can lead to better outcomes.
- The Georgia case study identifies a long list of challenges for the health system's response to diabetes, and in doing so helps highlight several issues of special importance to NCDs:
 - Some NCDs require sustained contact with multiple levels of the health system, implying a lot of back and forth in a manner that is more complex than in the case of the typical acute illness. Simply put, they require continuity of care. This underlines the need for clear divisions of responsibility between different types of providers and levels of the system, as well as strong information flows between the various actors.
 - The long-term nature of NCDs implies greater responsibilities for the patient, that is, self-management. This calls for more emphasis on patient education and support.
 - Many NCDs involve long-term pharmaceutical use, highlighting the importance of drug availability to a greater degree than for acute illnesses, which may require only a one-time prescription. Access to cheap medicines, physical access to pharmacies, and patient compliance are all important in this regard.
- The India case study highlights the long asymptomatic periods that follow exposure to risk factors and precede the recognition of symptomatic disease, and thus the gains to be won by finding ways to detect and diagnose NCDs as early as possible. Moreover, the India case also suggests that the poor may benefit disproportionately from better outcomes on this front. Long asymptomatic periods distinguish most NCDs from most acute illnesses, although important exceptions exist. This issue also highlights the importance of finding new approaches to promote access to care.

- The India case study also highlights the issue of the quality of care. Of course this is an issue for all health interventions, but the long-term nature of NCDs means that if a patient receives an incorrect diagnosis or inappropriate prescription (or both), the medical and financial implications can be even more severe. Quality of care is a broad topic that extends well beyond correct diagnosis and appropriate prescription as used in this example.

Although the appendix emphasizes what makes NCDs different, recognizing the parallels with certain communicable diseases is also important. For example, the launch of antiretroviral programs in many countries also implies increased service delivery volumes and the need for multiple contacts with different levels of the system. In addition, the importance of early diagnosis also applies to HIV/AIDS, tuberculosis, and sexually transmitted infections, among others. Indeed, lessons from HIV/AIDS, such as the importance of community engagement for encouraging voluntary counseling and testing, of working with nongovernmental organizations and civil society, and of public information campaigns, may be usefully applied to NCDs. Recognizing these parallels will permit the identification of potential synergies with other health priorities.

Other issues that emerge from the case studies include the following:

- Countries are already spending funds on NCDs. How efficiently and equitably are they doing so?
- To what extent can an emphasis on primary care, whether in the public or private sector, provide better value for money?
- What are the relationships among risk perception, prevention-seeking behavior, and information?

Indonesia: Forecasting and Financing Health Care Demand in a Middle-Income Country—Disease Transitions in East and Central Java

Attempts to forecast population health are fraught with difficulties, such as imperfect data and the need to adopt assumptions that are difficult to verify. However, responsible health system policy and planning require as credible a view of future health care needs as possible. Given this necessity, the task becomes how best to use existing information to orient forward-looking policy. As part of the background work for this report, World Bank researchers attempted such an exercise for two of

the largest provinces of Indonesia, East and Central Java, which have a total population of more than 70 million people. The results highlight not only the current importance of NCDs for health care demand, but the larger role NCDs will play in the future (for complete details, see Choi and others forthcoming).

Indonesia, like many developing countries, is currently experiencing the dual transition of demographic and epidemiological change. Fertility rates have been declining for an extended period, the population is beginning to age, and the rate of population aging will increase in the future. This necessarily implies a shift in the disease burden toward one common to older age groups. At the same time, Indonesia's economy is expected to grow at a healthy pace over the next 15 years, thereby creating a substantially larger pool of middle-class and wealthy consumers. As household incomes rise, people will demand more health care in general. Finally, the increasing prevalence of key risk factors, such as obesity and tobacco consumption, combined with an older population, will drive an increase in the relative burden of NCDs.

The increasing importance of NCDs creates a significant burden for health care spending, because costs per treatment, both outpatient and inpatient, are, on average, higher for NCDs than for communicable diseases, and because NCDs, compared with communicable diseases, require relatively more inpatient care, which is drastically more expensive than outpatient care.¹ In Central and East Java in 2005, NCDs already accounted for the majority of treatment cases and of spending: 50 percent of 60.1 million outpatient cases, 62 percent of 1.6 million inpatient cases, 62 percent of total outpatient spending (Rp 2.1 trillion), and 73 percent of total inpatient spending (Rp 5.5 trillion).

To estimate current private health care spending (for 2005) as well as spending in 2020, researchers separately modeled four major inputs into health care demand: (a) the total size of the population as well as the size of specific population categories by gender, age, and wealth; (b) the disease prevalence rates for specific disease categories; (c) the treatment rates and duration for each disease category; and (d) the costs of treatment.

Two scenarios are presented here: the first assumes that disease prevalence will change in the future at the rates suggested in the 1990 global burden of disease study for the Southeast Asia region (Choi and others, forthcoming), while the second scenario assumes no change in disease prevalence between 2005 and 2020. However, the overall disease burden in the second scenario will still shift as a result of changes in the population's age and wealth structure. Any difference in the number of cases by

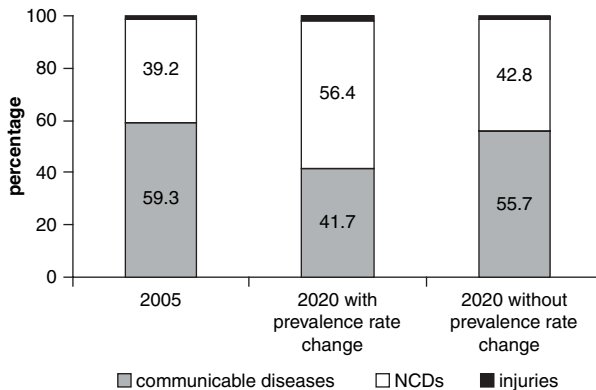
disease between the first and second scenarios comes exclusively from differences in forecasted disease prevalence.

Figure A3.1 looks at the relative mix of disease cases for 2005 and both 2020 scenarios. Currently, 39 percent of all illnesses in the two provinces are due to NCDs, but in just 15 years this is expected to increase to 56 percent of all illnesses as a result of aging, income growth, and changes in disease prevalence. Without changes in disease prevalence, the relative burden of NCDs is still expected to increase to 43 percent of all cases of illness. Given the uncertainty that surrounds forecasts of disease prevalence in the global burden of disease study, the range of outcomes presented here gives likely upper and lower bounds on the increasing presence of NCDs in the overall disease burden.

Table A3.1 translates the disease burdens in 2005 and 2020 into standard utilization measures of outpatient visits and inpatient bed days. NCD-driven utilization already accounts for the majority of contacts with the health system in East and Central Java: 54 percent of all outpatient visits and 67 percent of all inpatient bed days. This proportion will increase in the future to 58 to 71 percent of outpatient visits and 72 to 79 percent of inpatient bed days.

Finally, if we look at private health spending as portrayed in figure A3.2, the increase in spending attributable to NCDs is also substantial. In 2005, 70 percent of private spending was driven by NCDs, and this is expected to increase to 75 to 80 percent of total private spending by 2020. By this measure, up to four-fifths of all health care demand will be

Figure A3.1. Distribution of Total Cases by Disease Group, East and Central Java, 2005 and 2020



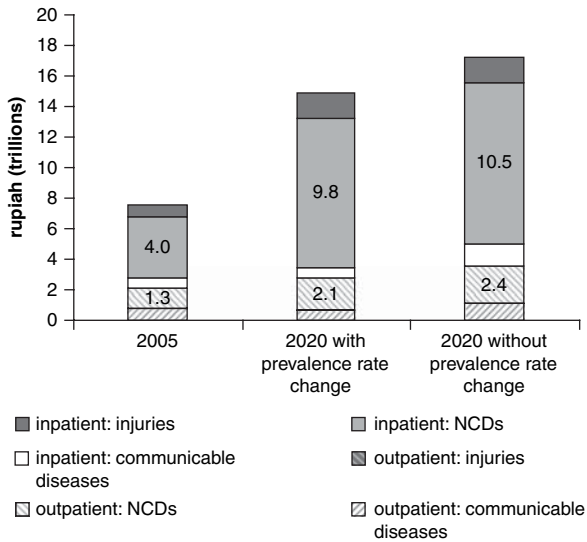
Source: Choi and others, forthcoming.

Table A3.1. Total Number of Outpatient Visits and Inpatient Bed Days by Disease Group, East and Central Java, 2005 and 2020*(thousands)*

<i>Category</i>	<i>Disease group</i>	<i>2005</i>		<i>2020</i>		<i>2020</i>	
		<i>Number</i>	<i>Percentage of total</i>	<i>With prevalence rate change</i>	<i>Percentage of total</i>	<i>Without prevalence rate change</i>	<i>Percentage of total</i>
Outpatient visits	Communicable diseases	71,182	44	50,496	27	95,826	40
	NCDs	87,122	54	130,498	71	138,129	58
	Injuries	2,659	2	3,427	2	3,785	2
	Total	160,963	100	184,421	100	237,740	100
Inpatient bed days	Communicable diseases	2,140	23	2,041	12	3,987	19
	NCD	6,306	67	13,574	79	15,254	72
	Injuries	936	10	1,660	10	1,816	9
	Total	9,382	100	17,275	100	21,057	100

Source: Choi and others forthcoming.

Figure A3.2. Total Private Spending on Outpatient and Inpatient Care by Disease Group East and Central Java, 2005 and 2020



Source: Choi and others forthcoming.

for NCDs. As overall spending, measured in 2005 rupiah, is expected to rise considerably over the 15-year period from Rp 7.5 trillion to between Rp 14.8 trillion and Rp 17.2 trillion, the market for NCD treatment will be at least twice as large just 15 years into the future.

Although the particular forecast of health and health system outcomes depends on the scenario adopted, the general picture that emerges from this exercise is clear: the demand for curative care will increase significantly as the population simultaneously grows, ages, and becomes wealthier. Even though a large number of communicable disease cases will persist, the relative burden of NCDs will increase, perhaps by a substantial margin. The implications of such a change in terms of health care infrastructure and financing needs are significant.

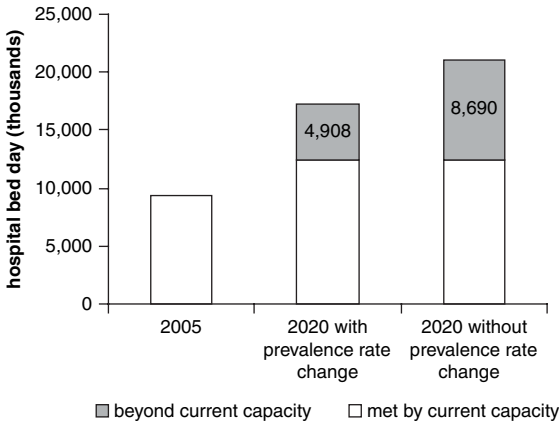
Thus, the Indonesian health system needs to prepare for a future of rising health care demand largely driven by an increasing burden of NCDs. How the health system will meet the future demand for curative care as well as maintain or enhance necessary public health functions is a question that policy makers need to consider now. The forecasts of health care demand in East and Central Java presented earlier enable an analysis of some dimensions of future system costs implied by the rising demand. The focus here is on inpatient care, in particular, the number of required hospital beds, as well as health sector staffing needs more broadly.

To assess available hospital capacity in the future, researchers assumed a 90 percent bed occupancy rate in 2020 among the existing hospital stock, and from this figure inferred the shortfall in beds demanded. For the number of physicians, researchers assumed a goal of tripling the current physician-to-population ratio of 11.3 per 100,000 to bring this ratio closer to international standards. Finally, for the number of nurses and other medical staff, researchers assumed that the current nurse-to-physician ratio of 4.8 will be maintained in 2020. These assumptions allow a calculation of the monetary investments needed to meet the estimated demand in hospital beds, physicians, and nurses.

If hospitals can operate effectively at a 90 percent bed occupancy rate—actual occupancy is substantially lower—currently 12.37 million hospital bed days are available in the two provinces. This meets the estimated demand of 9.4 million bed days for 2005, but the number of extra bed days necessary to meet the increased demand in 2020 is either 4.9 million or 8.7 million depending on the scenario (figure A3.3). Of course, if hospitals operate at their current bed occupancy rates into the future, then the necessary investments under each scenario will be substantially greater.

Switching from bed days to actual hospital beds, researchers calculated the necessary investment for extra hospital beds to meet increasing needs for inpatient care. Currently 38,000 hospital beds are available in the two provinces, but estimated demand for 2020 ranges from 53,000 to

Figure A3.3. Number of Hospital Bed Days in the Context of Current Capacity with an Occupancy Rate of 90 Percent, East and Central Java, 2005 and 2020



Source: Choi and others forthcoming.

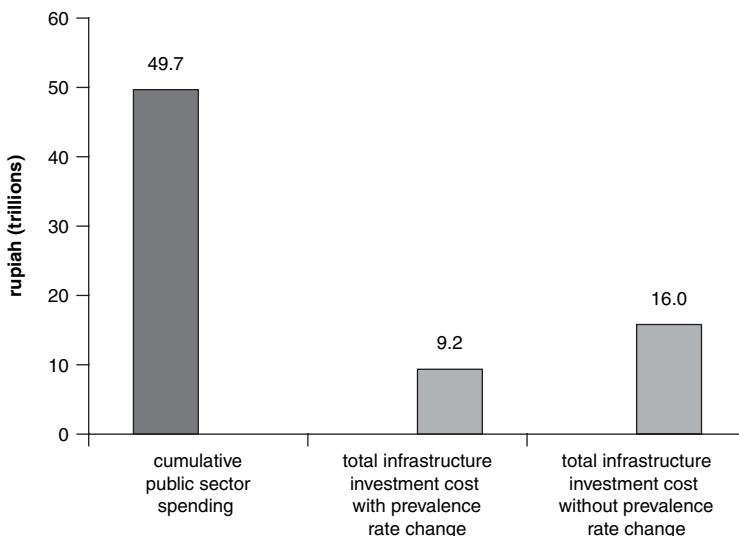
Note: Current capacity is 12.4 million hospital bed days with a 90 percent bed occupancy rate.

64,000, indicating that a shortfall of 15,000 to 26,000 hospital beds will occur. The corresponding investment cost for hospital beds to bridge the gap ranges from Rp 8.7 trillion to Rp 15.4 trillion. These investment estimates are strictly for the cost of providing hospital beds. The costs of providing additional medical equipment could add up to an additional 40 percent of the investment in hospital beds.

Meeting the demand for medical personnel will also present a challenge. In particular, the current capacity of medical schools would not provide enough physicians to meet future demand. Demand in the two provinces will be for about 8,000 physicians, which current medical school capacity cannot meet by 2020. Filling the gap requires another Rp 507 billion. At the same time, assuming that the current nurse-to-doctor ratio will be sufficient in 2020, the current nursing school capacity will produce about 3,000 extra nurses by 2020, implying no shortfall in training capacity for nurses.

To put these estimated investment needs in context, researchers calculated cumulative public sector health spending between 2005 and 2020 and compared it with the estimated cost of investment in infrastructure. As figure A3.4 depicts, estimated total public health spending will come to Rp 49.7 trillion. Currently, Indonesia's public health system not only provides population-based preventive health services, but is also a major provider

Figure A3.4. Cumulative Public Sector Spending and Total Cost of Infrastructure Investment Needed between 2005 and 2020 by Scenario, East and Central Java



Source: Choi and others forthcoming.

of curative care, handling 42 percent of all outpatient visits and 58 percent of inpatient commitments. Clearly, the need to adjust to the future disease burden is likely to place a severe strain on the public budget.

If the forecast investment needs were to be funded entirely out of the public budget, the total cost of infrastructure investment required would consume 20 to 32 percent of cumulative total future public spending, depending on the scenario. Considering that the infrastructure investment cost estimates do not include such important factors as nonhospital medical equipment, an even higher portion of public spending would be required for comprehensive infrastructure investment. These figures may not be tenable given the essential public health services and salary support for medical practitioners that will also be required over this period.

Of course, the need for core public health services, such as immunization, health promotion, and disease surveillance and prevention, will continue into the future, so the question of how to finance the infrastructure needs becomes crucial. If the future resembles the scenarios presented here, maintaining core public health services while providing for health infrastructure as called for by future needs will present a serious challenge.

Given these forecasts, a medium-term strategy for the health sector would ideally specify the role of the private sector, including the provision of both outpatient and inpatient care. Given limited public budgets, for the public sector to continue to provide almost half of the curative care demanded by the population may not be prudent, unless the public budget can be increased substantially. If private sources of investment are deemed necessary, the policy question becomes one of how to manage the investment climate in the health sector, including such issues as investment guidelines and technology assessments, in order to attract sufficient investment and ensure that investments are efficiently managed and do not shift services onto a high-cost path.

In sum, the shift from relatively more communicable diseases to more NCDs during the epidemiological transition will entail a greater volume of service delivery and higher demand for inpatient care. As the Indonesia case study demonstrates, preparing for these changes should be an important priority for policy makers.

Georgia: Diabetes and Systemic Constraints

Georgia's health system has faced substantial challenges following independence. The system proved to be both unaffordable and poorly suited

to the new health challenges of the 1990s, in particular, those posed by complex chronic diseases. Georgia has sought to address these challenges at every level of the health system; however, while the reforms have been bold, they have not yet succeeded in meeting their goals of providing basic health care to all who need it. The aim of this case study is to use diabetes as a lens for identifying health care system constraints that might otherwise be overlooked. The material presented here draws on a background paper that was written as part of the work program underlying this report (Balabanova, McKee, and Koroleva 2006).

In the early 1990s, health care for patients with diabetes essentially collapsed. Until 1995, the Soviet model of health care that had guaranteed free treatment to all patients with diabetes was, in theory, still in place, but in reality, the system of outpatient and inpatient services had broken down and supplies of insulin were no longer guaranteed. Since 1995, the reform process has intensified, especially in relation to primary health care, with the launch of the State Program to provide free insulin to all patients with diabetes. Outpatient services for patients with diabetes were incorporated into the basic benefits package and are currently funded from public sources. Children with diabetes receive particular attention and are entitled to free, high-quality preventive and treatment services.

Using a framework developed in the background paper, the system for diabetes care can be mapped and areas that are underresourced and neglected can be identified. In terms of inputs, Georgia has an extensive network of outpatient health facilities. Despite the overall lack of investment in the health system, people with diabetes are guaranteed a basic minimum of services and drugs. Clearly, however, additional investments, as well as improved allocation of existing resources, are needed to provide all patients with the most basic services, such as consultations with specialists when needed, provision of strips and syringes, and treatment of complications.

However, the problem goes beyond a shortage of funds: no formal clinical guidelines for the management of diabetes are available. Most of the physicians interviewed reported that they treat patients using knowledge received when at university, informal communications with colleagues, or occasional attendance at conferences and seminars that help them learn about modern methods of diabetes management. Few physicians or endocrinologists have access to sources of recognized evidence or formal support.

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 and costly. Given that hospital-dominated models of service delivery have changed little, few benefits will result from investing money in training family physicians and endocrinologists in outpatient facilities. Family physicians and endocrinologists in these facilities have lost their skills with the loss of many of their previous responsibilities, for example, prescribing insulin or changing patients' treatment regimens. Polyclinics do not provide specialist care; they serve simply as referral points from which patients with increased blood sugar levels are referred to specialists. In effect, polyclinic physicians act as little more than administrators, authorizing prescriptions obtained at the tertiary level and giving patients forms for obtaining free insulin from pharmacies. Enhanced training without a substantial redefinition of task profiles, the simplification of procedures, and the provision of consistent support will achieve little.

The case study also shows that the presence of appropriate inputs alone will be insufficient to produce an effective model of diabetes care unless the mechanisms to ensure that such inputs achieve their purpose are in place. Even though the government fully finances the supply of insulin (an essential input), an excessively centralized system of insulin distribution and dependency on multiple visits to different levels of the health system mean that, in effect, access to insulin is often obstructed for people who find navigating the system difficult or who live far away from the designated insulin-dispensing pharmacies. In addition, adults with diabetes are not provided with free syringes or related supplies or with hypoglycemic drugs. This creates significant financial barriers to ensuring a continuing supply of insulin, the lack of which increases the risk of complications.

The requirement to admit people suffering from complications of diabetes to hospitals renders such care essentially unaffordable in many cases, leading to catastrophic pressure on family finances (Gotsadze and others 2001). Furthermore, the ubiquitous and extensive out-of-pocket payments to service providers pose a particular threat to those with chronic diseases in need of uninterrupted treatment regimes despite the efforts to provide them with free access to care. In addition, the linkages between primary and secondary care are poor and no effective mechanism for patient follow-up exists. Multiple data collection systems are in place, with every health facility keeping its own records, and mechanisms for providers to exchange information with one another are absent unless informed patients manage the process themselves.

Effective management of diabetes requires empowering patients to take control of their condition, but patients rarely have the necessary

self-monitoring equipment because of its high cost. Little effort is made to inform patients and to provide them with the skills for self-care or the knowledge to adhere to an appropriate diet, apart from occasional advice by endocrinologists during visits to facilities. No routine screening of adults for retinopathy or specialized programs to prevent diabetic foot disease are available.

Optimal management of diabetes also requires a system to monitor outcomes from different perspectives (clinical and social). Current data collection systems do not permit reliable assessment of outcomes or routine monitoring. In addition, discrepancies exist between different sources of information. Those indicators that are available suggest that management of diabetes and its complications, for example, coma, is suboptimal. Little information is available about the effects of long-term illness on employment, social inclusion, and families' socioeconomic status.

Even though the government has invested considerably in regulating the system for diabetes care and many of the essential inputs will soon be in place (free insulin, primary care physicians trained to manage diabetes, state-guaranteed package of care), in practice, these inputs fail to translate into more accessible and affordable primary care. This demonstrates the need to look beyond inputs alone by also considering the linkages and interactions between various health system components.

The situation in Georgia resembles what has been observed in other former Soviet Union countries (Hopkinson and others 2004; Rese and others 2005; Telishevskaya, Chenet, and McKee 2001). Most countries have embarked on ambitious health system reforms, emphasizing primary care, purchasing and contracting for care according to needs, procuring and distributing drugs on a competitive basis, and reforming social protection systems. However, reforms have often involved investing in and transforming particular system components in isolation, with little attention being paid as to how they fit with other system elements and mechanisms. For example, the training of large numbers of primary care physicians has not been accompanied by investments in infrastructure and basic resources or attention to referral patterns to allow the newly trained professionals to provide effective care for diseases such as diabetes and its complications. Problems are also apparent in getting health systems that historically have been hierarchical and organized around vertical models of care to provide the complex care needed to deal with diabetes.

The study shows that the complexity of pathways to care and the uncertainty about the costs involved create a major barrier to continuing

care, but those with diabetes, whose expectations of the system were low, did not initially mention fragmentation of the system as a problem. They accepted that they would need to make six or seven visits to different locations to obtain free insulin. The system appears to prioritize control of the insulin supply and prevention of abuse over ease of access by patients. In Georgia, as in other former Soviet Union countries, reforms have rarely taken patients' interests into account, especially those with chronic diseases who require long-term care, and have uniformly involved reliance on out-of-pocket payments at the point of service, thereby creating financial barriers to access (Lewis 2002; Preker, Jakab, and Shneider 2002) and unnecessarily complicated pathways to care. Placing the experience of users and providers at the center of the delivery of diabetes care provides a starting point for exploring the continuum of care and identifying the inputs required at each stage.

The following issues emerge from these findings that are relevant to improving diabetes management in Georgia:

- A model of health care delivery needs to be developed that ensures linkages between primary- and secondary-level health facilities, sharing of information, and patient follow-up. This should facilitate the transfer of responsibility for managing diabetes and other chronic diseases without complications to outpatient facilities and lead to an understanding that hospitalizing all patients with diabetes is unnecessary.
- The delivery systems should be reorganized to simplify pathways to care and medication for people with diabetes.
- A health information system that captures data relevant to diabetes and its complications should be developed.
- A support system that enables people with diabetes to provide self-care, including adherence to effective treatment and to a healthy diet and lifestyle, and to prevent complications should be created.

As noted in the introduction, these priorities reflect some of the characteristics of NCDs that require different approaches from those applied to acute illnesses. These include the complexity of care, including sustained contacts with multiple levels of care; the importance of patient self-care over the long-term; and the frequent need for access to medications along with quality of care considerations. Recognizing the different nature of NCDs can help inform policy priorities.

India: The Value of Information about NCD Status

An important characteristic of most chronic NCDs is that they develop through a continuum, starting (in many cases) with behaviors and going through biological risk factors until disease is established. During this process the patient remains asymptomatic for long periods, but it is precisely at these stages when the process can be reversed and the risk of premature mortality can be decreased. This is true for diabetes; cardiovascular disease; and certain types of cancers, such as cancer of the cervix uteri and of the breast. The focus of this case study is on the value of information about a patient's NCD status and the implications for policy.

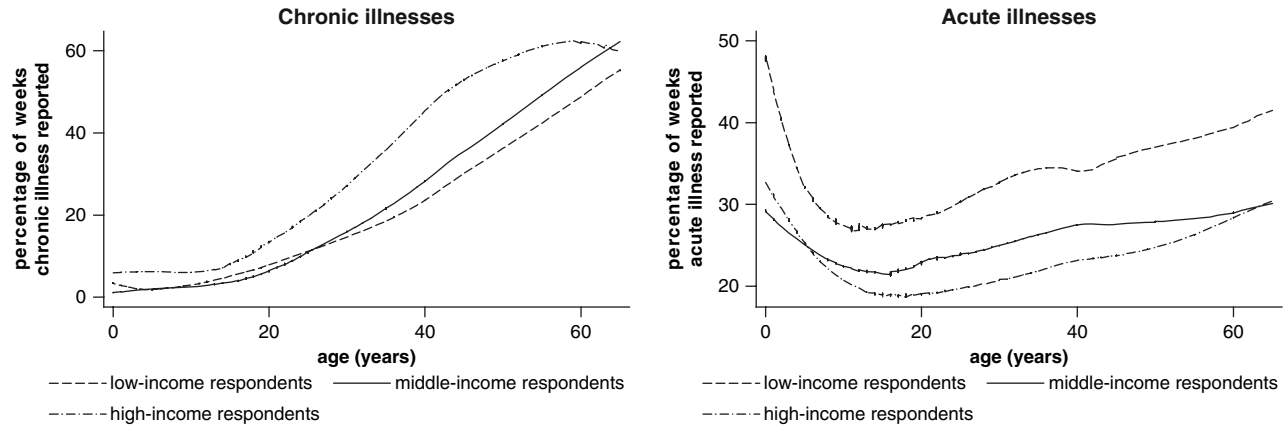
When a person has an undiagnosed NCD, he or she may receive no treatment at all, or, alternatively, the chronic illness may be reported and treated as an acute illness, a phenomenon that we will refer to as acute illness displacement. In addition to the medical implications of not receiving the appropriate treatment, there are also financial implications of wasting money on the wrong treatment and potentially spending even more money later on because of the delayed diagnosis. Thus, timely diagnosis of an NCD can be welfare improving in more than one way.²

Findings from a Delhi data set help illustrate some of the issues. A longitudinal study of morbidity and health-seeking behavior carried out by a think tank (the Institute of Socioeconomic Research on Development and Democracy) followed 1,600 individuals, asking them about their illnesses during the previous week in 54 visits over two years. The main findings pertain to rich-poor differentials in reporting illness and the response of individuals to information about their chronic illness.

In figure A3.5, the vertical axes plot the percentage of weeks that a person reported a chronic or an acute illness. As illness patterns differ by age, the results are plotted against the age of the individual on the horizontal axes. A particular characteristic of the survey was that individuals were asked about their chronic and acute illnesses separately. Acute illnesses were captured with this screening question: "Were you sick in the last week?" Chronic illnesses were prescreened during the first visit, and in each subsequent visit the person was asked about the chronic condition and what he or she had done about it. Finally, the interviewer also asked whether the person was aware of any new illnesses.

Two main patterns stand out. First, richer people reported chronic illnesses far more frequently at every age than the poor. Second, the poor reported a much greater incidence of acute illnesses than middle-income respondents or the rich. This was true for virtually the entire age cohort. As

Figure A3.5. Reporting of Chronic and Acute Illnesses by Income Group, Delhi



Source: Das and Hammer 2006.

would be expected, acute illnesses were higher among infants and young children. In a multivariate regression using age, gender, and per capita expenditure as explanatory variables, a household in the lowest tercile of expenditure was estimated to be 11 percentage points less likely to report a chronic illness, and the effect is equal and opposite for acute illnesses.

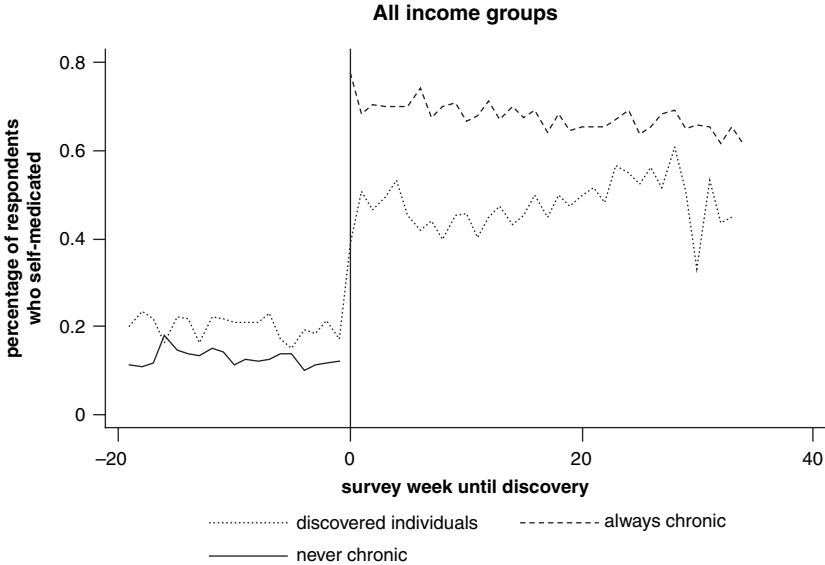
Combining acute and chronic illnesses into a single variable referred to as sickness confirmed that rates of self-reported illness were higher among the rich than the poor (with a 6 percentage point, or 15 percent, difference). Reported illness reflects both medical reality and knowledge of illness. Das and Hammer (2006) submit that while part of the difference between the rich and the poor could truly reflect underlying medical conditions, the gap in clinical prevalence studies is too small to account for the full difference, suggesting that information about illnesses plays an important role. For instance, biomedical comparisons of diabetes and hypertension among the rich and the poor suggest that the rich are 7 percent more likely to have one of these illnesses, compared with a more than 33 percent difference in reported chronic conditions in the Institute of Socioeconomic Research on Development and Democracy data. In sum, the results suggest that a better diagnosis can be welfare improving, particularly for the poor.

To address the question of how patients respond to the revelation of information about chronic illness, the longitudinal nature of the data collected in Delhi is critical. In particular, as individuals were followed over a two-year period, some of them were diagnosed with a chronic illness. A comparison of their behavior before and after the diagnosis provides some insights into the potential responses by different population groups.

Das and Hammer (2006) present a detailed econometric analysis in which they examine the effects of the diagnosis, controlling for individual fixed effects, that is, they compare outcomes for the same person before and after diagnosis, and use the fact that the discoveries were at different points in time to control for potential confounding effects due to the timing of illness. Figure A3.6 shows how the diagnosis of a chronic illness changed behavior, in this case, self-medication. The figure looks at the behavior of three groups of individuals: those who never reported chronic illnesses during the two years of the survey (labeled as never chronic), those who reported a chronic illness from the beginning of the survey (labeled as always chronic), and those who were diagnosed at some time during the survey (labeled as discovered individuals).

Individuals who were never chronic did not self-medicate much and the pattern was stable over time. In contrast, the always chronic

Figure A3.6. Self-Medication in the Institute of Socioeconomic Research on Development and Democracy Sample



Source: Das and Hammer 2006.

self-medicated almost seven times as much. The behavior of the discovered individuals was remarkable. Before diagnosis, their self-medication patterns were much closer to those of the never chronic, although they clearly medicated more, a characteristic that was almost entirely due to more illnesses among the discovered individuals group. In the week that they were diagnosed, this group demonstrated a large, discontinuous jump in the amount of self-medication. Furthermore, an upward trend in self-medication was apparent, so that by the end of the observation period, the behavior of the always chronic and the discovered individuals was similar. Using multivariate regression techniques, the authors confirmed these results for medication patterns and the reporting of acute illnesses. The basic results are as follows:

- A large increase in all medication (whether self-medicated or received from a doctor) followed the diagnosis of chronic illness. Across all diagnosed individuals, that is, all income groups, self-medication in any given week more than doubled from 20 to 45 percent of individuals.
- A reduction in the reporting of acute illnesses by 23 percentage points occurred across the income groups. The reduction was largest for the

rich, but was also large and significant for the poor and the middle-income group.

- No increase occurred in the health expenditures of the individuals with a newly diagnosed condition. These individuals were already spending on treating the symptomatic manifestations of their chronic illnesses. The diagnosis implied a shifting of expenditures, but not necessarily an increase.

The fact that poor people were able to respond to the new information implies that they were able to finance their own treatments. Of course, that the new treatments did not lead them to incur additional expenditures helped, but this also implies that even for illnesses that require long-term financing, studies need to establish that credit constraints are binding rather than rely on intuition. In relation to the study discussed here, note that drug prices tend to be lower in India than in many other low-income countries, suggesting that the outcome may not be the case in all other countries.

A number of policy implications emerge from these findings. Perhaps the most important is the need for new approaches to access given the potential welfare improvements, particularly for the poor, that can arise from timely diagnosis of an NCD. The first critical contact between a patient and the health system is likely to be more elusive for NCDs than for many acute illnesses because of the potentially long asymptomatic periods. Health worker outreach to engage communities, and possibly conditional cash transfers for screening if warranted, may help in this regard. Lessons learned from cancer screening or from HIV/AIDS case detection may be applicable here. Chapter 2 briefly discussed some of the challenges of reaching the poor.

A second policy implication relates to the quality of care. Access to care is a necessary, but insufficient, condition for welfare improvement, as the diagnosis may be incorrect or the treatment prescribed may be inappropriate. As noted at the outset, there can be long-term medical and financial implications if, for example, NCD symptoms are incorrectly diagnosed as an acute illness and the treatment addresses those symptoms rather than the underlying disease. In the Indian context, where the private health sector predominates over the public sector, this contains an important message for the quality of care provided in the private sector.

In sum, the Indian case study indicates that the poor are less likely to know that they are ill with an NCD, and a timely diagnosis of NCDs can

be welfare improving for multiple reasons. Thus, policies aimed at improving the diagnosis of NCDs, particularly for the poor, can be beneficial.

Notes

1. For example, inpatient treatment constitutes only 3 percent of the 61.7 million total disease cases treated in Central and East Java in 2005, but 72 percent of total private spending (Rp 7.6 trillion) is attributable to inpatient care (Choi and others forthcoming).
2. A number of caveats are important in relation to the discussion of the value of timely and accurate diagnosis for NCD patients. For example, an early diagnosis may not be desirable for patients with incurable NCDs. Also some conditions, such as hypertension, may manifest themselves in an episodic manner in some patients, in which case there is a danger of overdiagnosis and overtreatment. Finally, discussions of accuracy should acknowledge the errors of inclusion or exclusion in diagnosis that exist in all health systems. In general terms, however, the basic message of the value of timely and accurate diagnosis still applies.