

Chapter 17

Financing Cancer Care in Low-Resource Settings

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INTRODUCTION

Cancer accounts for a rapidly growing health and economic burden in low- and middle-income countries (LMICs) (Knaul and others 2014). The long-term nature of chronic and noncommunicable diseases that characterizes many cancers inflicts repeated financial onslaughts on families, intensifying the poverty-illness cycle. Inadequately treated illnesses deepen poverty, leading to a cycle of loss of health, lack of treatment, higher morbidity, lost income, and deeper impoverishment (Atun and Knaul 2012).

Many LMICs are working to achieve greater, and even universal, financial protection in health care, with funding from domestic sources that combines public insurance and prepayment. Establishing universal entitlement to key services through guaranteed benefits packages is a cornerstone of these efforts. These countries face challenges as they strive to include cancer and other chronic and noncommunicable diseases in the package of covered services. The inclusion of cancer interventions poses a specific set of challenges because of the chronic nature of the illness and the high costs of treatment.

An effective response to cancer requires strengthening all health system functions—stewardship, financing, service provision and delivery, and resource generation—along the entire, six-component, care-control continuum—primary and secondary prevention,

diagnosis, treatment, survivorship, rehabilitation, and palliative care and pain control (Hewitt, Greenfield, and Stovall 2005; Knaul, Alleyne, and others 2012). The failure to adequately manage one of the components can jeopardize the entire response, resulting in premature deaths, unnecessary pain, and wasted resources. Although responding to all facets of the continuum is a daunting task, several countries have included cancer care in recent reforms designed to achieve universal health coverage (UHC); these reforms provide useful lessons for other countries.

This chapter analyzes one health system function—financing—in relation to cancer, focusing on treatment. The analysis draws on experiences from several middle-income countries (MICs) in which domestic finance is used and efforts are underway to achieve universal coverage. We draw lessons for other components of cancer care and control and highlight the importance of developing strategies for financing that consider all aspects of the care continuum and strengthening of health systems.

Our analysis focuses on how domestic sources of funding are deployed to finance cancer care; we leave for later work the issues of how these funds are sourced and collected. Domestic funding in the vast majority of LMICs does, and will inevitably continue to, pay for the bulk of cancer care. We do not focus on global and regional financing and platforms; this is a topic for future research. These platforms are especially important

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sources of finance for the poorest countries, for catalyzing discovery and innovation and for aggregating demand to reduce the costs of medicines and vaccines.

FINANCIAL PROTECTION, HEALTH FINANCING, AND CANCER CARE¹

The set of diseases that we call *cancer* leads to some of the most problematic financial issues in providing care for chronic and noncommunicable diseases. Some cancers can be prevented by changing behaviors or by controlling cancer-associated infections. For other cancers whose causes are unknown, the only effective control comes from early detection and treatment. Even where the causes are known and somewhat controllable, early detection and treatment remain the best course for cancers that are not prevented. For some cancers, especially those detected at later stages, even the most advanced treatments are not effective and palliation is the appropriate course of action (Gralow and others 2012).

Cancer often requires relatively expensive, complex, multimodal medical treatment for extended periods, leading to household impoverishment, treatment abandonment, and, too often, poor outcomes, especially if the disease is detected at a later stage or patients cannot adhere to a full regime of treatment. Yet many interventions for cancer are both effective and cost-effective according to today's global metrics. Recent discoveries have made it possible to prevent several of the infection-associated cancers that disproportionately affect poor people because of their exposure to communicable diseases and lack of access to early detection of precancerous lesions. For example, vaccinating against the human papillomavirus (HPV) can prevent the most common cervical cancers, the vast majority of which occur in LMICs.

Need for Financial Protection

Acute care costs, even for simple ailments, can push already poor families deeper into poverty. The repeated and ongoing costs of a chronic illness are more devastating. India provides an example of the substantial financial vulnerability of households to noncommunicable diseases, especially cancer. In India, the share of out-of-pocket health expenditure devoted to noncommunicable diseases increased from 33 percent to almost 50 percent from 1995 to 2004. The cost of a single stay for cancer or heart disease in a public hospital is the equivalent of 40–50 percent of gross domestic product (GDP) per capita (Mahal, Karan, and Engelgau 2010). As a result, cancer-affected households

derive over 30 percent of annual inpatient expenditures from borrowing and asset sales, which is significantly greater than the reliance on these funding mechanisms by unaffected households (Mahal and others 2013). In South Asia, the probability of incurring catastrophic health expenditure from hospitalization is 1.6 times higher for cancer than for a communicable disease, such as pneumonia (Engelgau and others 2010; Nikolic, Stanciole, and Zaydman 2011).

One of the most insidious aspects of this illness-impoverishment cycle is that for many patients, out-of-pocket spending is wasted because it contributes nothing to improved health. Especially in LMICs, cancer is often detected so late that even the most effective treatment will not effect a long-term cure. Second, a substantial proportion of what is spent by patients buys low-quality or inappropriate care that is ineffective. Third, care may be coupled with prohibitive transportation costs and investments of time that include long waits to access care. These difficulties are more likely to occur with a disease such as cancer, where care often requires repeated travel and months-long treatment.

Cancer Care Financing

In all LMICs, most of the financing for cancer care and control is, and will continue to be, from domestic sources. This is especially true for MICs where external financing is 1 percent or less of total health expenditure. An important exception is the poorest and most aid-dependent countries. However, even countries as poor as Ethiopia, Haiti, and Niger rely on domestic funding for more than 50 percent of their total health expenditures. The World Health Organization (WHO) estimated that in 2008, external sources covered 16.4 percent of total health expenditure in LMICs (WHO 2011a).

Domestic finance of health care comes from two primary sources: (1) out-of-pocket spending by families, either at the point of service or via private insurance (the latter being much less common in LMICs), and (2) public spending for health or broader social protection organized as public insurance. Out-of-pocket spending by families is the least equitable and efficient means of financing health systems and often leads to impoverishment. Out-of-pocket expenditures as a share of total health expenditures is highest in LMICs—about 50 percent—and lowest in high-income countries (HICs), averaging 14 percent (World Bank 2013). By contrast, public financing or insurance schemes that enable prepayment and pooling offer financial protection from excessive expenditures for health care and can create more effective and equitable ways of organizing health system financing (Knaul and others 2006; WHO 2010).

The movement toward UHC is a transition to pooled, publicly financed health care that offers financial protection to families and constitutes the scaffolding that will support cancer coverage in LMICS. Achieving UHC involves a process with overlapping stages, beginning with enrollment and legal coverage, which entitles all people to health services funded by publicly organized insurance. The second stage is coverage that seeks to guarantee access to a comprehensive package of health services. The third stage is universal effective coverage that guarantees the maximum attainable health results from an appropriate package of high-quality services for the evolving health needs of a population. UHC implies financial protection that promotes equity and efficiency and reduces the risk of financial shocks to families by reducing out-of-pocket payments (Knaul, González-Pier, and others 2012).

Financial protection toward UHC can expand in three ways and is often tied to growth in resources allocated to health and overall growth of country income:

- Expansion of prepayment and risk pooling over time to cover entire populations, in some cases on a group-by-group basis
- Provision of a more comprehensive benefit package of health interventions and covered conditions
- Expansion of risk pooling and financial risk protection through the elimination of out-of-pocket expenses at the point of service delivery for the poor and for those interventions considered of high value where use should not be deterred (Jamison and others 2013)

These three dimensions of coverage are summarized in WHO's (2010) financing "cube" as *height, breadth, and depth*. For a health system to achieve universal coverage, the height (proportion of the service cost covered), breadth (covered services), and depth (proportion of the population covered) must be taken into account (WHO 2010). The goal of UHC, according to WHO, is to ensure that all people are able to obtain the health services that they need without suffering financial hardship because they cannot afford to pay for them (WHO 2012, 2013).

Country Approaches

The country-specific roadmap to UHC can take several routes. One approach that has been strongly advocated in the literature is what Gwatkin and Ergo term "progressive universalism" (2011), which refers to the determination to include people who are poor from the outset as programs and policies to promote UHC are introduced.

Two major paths of progressive universalism have been identified, both of which use prepayment and pooling of funds to extend publicly financed insurance. The first route drives the expansion of population coverage and targets the poor by insuring health interventions for diseases that place a high burden on this group, with no co-payment for anyone. The second variant begins with a larger package for the poor. The definition of the package is pivotal and based on burden of disease. Recommendations include highly cost-effective interventions for infectious diseases and reproductive, maternal, newborn, and child health, as well as chronic conditions and noncommunicable diseases. For cancer, the package includes interventions for prevention, early detection, treatment, and palliation, focusing on those cancers of highest burden and interventions of greatest potential effectiveness, especially for the poor (Jamison and others 2013).

In practice, countries have tended to apply a combined or iterative approach, depending on the point of departure to UHC. The point of departure is often a political issue and largely determined by existing institutional arrangements and the availability of resources. Mexico's Seguro Popular design, for example, is based on universal population coverage with no co-payment for community services, sliding scale prepayment for personal health services that exempts the poor, and universal population coverage without prepayment for catastrophic illness; all of these elements are anchored in an expanding benefit package of cost-effective services that includes an increasing number of cancers. A related approach focused on enhancing equity in Turkey has been analyzed in detail (Atun and others 2013).

Cancer—because it encompasses a set of chronic and complex diseases—challenges the limits of UHC and the pathways to progressive universalism. A defining characteristic of most cancers and many other chronic diseases is the need, on a population level, for a series of interventions along the care-control continuum and illness lifecycle.

Analyzing the extent to which effective interventions for specific cancers are covered along the continuum provides insights into the depth and breadth of the overall package, as well as the balance between prevention and treatment. To ensure effective coverage, the benefits package needs to be guaranteed with permanent revenue sources and capacity-building commitments. Low effective coverage—particularly of early detection—is common, even in countries with relatively complete benefit packages. This situation compromises final outcomes (Knaul, Chertorivski Woldenberg, and Arreola-Ornelas 2012).

PATHS TO UNIVERSAL HEALTH CARE FINANCING

Countries are following different paths to UHC. Some countries, mostly of middle income, in Latin America and the Caribbean (Colombia, the Dominican Republic, Mexico, and Peru, for example) have extended public insurance to nonsalaried workers, the unemployed, those out of the labor force, and the poor; these countries are making adjustments to equalize benefits across groups. Thailand has followed a similar path, beginning in 2002, and India is beginning this process. China has extended coverage of the national medical insurance program widely, but with a high co-payment and no coverage for catastrophic expenditures. LMICs in Sub-Saharan Africa (such as Ghana) face much greater resource constraints, and UHC tends to be associated with a more restricted package of services. We illustrate some of the differences and similarities among countries in their paths to UHC by considering the specific case of introducing coverage for cancer, focusing on treatment.

This section draws on case studies of eight countries: China (Yerramilli and Jiang 2013), Colombia (Guerrero, Amaris, and Yerramilli 2013), the Dominican Republic (Rathe, Knaul, and Yerramilli 2013), Ghana (Yerramilli and Ataguba 2013), India (Yerramilli 2013), Mexico (Knaul, Chertorivski Woldenberg, and Arreola-Ornelas 2012), Peru (Seinfeld and Pleic 2013), and Thailand (Yerramilli and Firestone 2013). The four case studies from Latin America and the Caribbean are updates of earlier case studies from Atun and Knaul (2012). Salient details for the eight countries are summarized in table 17.1. Common themes and lessons emerge from these experiences. Each country faces the challenge of including chronic, catastrophic illnesses such as cancer in the package for rich and poor.

Health Insurance Coverage by Population Group

Health systems have historically built their financing schemes around sources of funding rather than health needs, often leaving the poor without access to pooled, public financing systems or opportunities for prepayment. One of the core ideas of UHC and progressive universalism is the determination to cover the poor first and relieve this group of the burden of impoverishing and catastrophic health spending.

In countries that finance their health systems through health or social insurance, salaried workers and government employees are typically the first to be covered, financed by payroll deductions supplemented by employer contributions. In many countries, this group has access to superior social security health

facilities, while all other groups (nonsalaried workers, the unemployed, those outside the labor force, and agricultural workers, all of whom tend to be poorer) are limited to usually lower quality, public facilities (or those provided by nongovernmental organizations) that may have user fees and that often ration care by availability and expertise. In such cases, medication costs are frequently paid out of pocket.

The path from this pattern of segmented coverage to universal coverage has varied. Canada and many countries in Europe (the United Kingdom and the Nordic countries, for example) rely heavily on general taxation revenue to finance the system; others more strongly emphasize the contribution of private health insurance, either voluntary or mandatory (Singapore and the United States). Some countries, for example, Germany, have brought together coverage of distinct groups to reach comprehensive coverage.

The Lancet Commission on Investing in Health evaluated the extent to which the path toward increasing coverage of different groups is universal and progressive (Jamison and others 2013). In Latin America and the Caribbean, where health care provision has been highly segmented between those covered by social security and those not, several countries have moved to invest in publicly financed programs to extend pooled coverage, focusing on the poor and nonsalaried workers, and to reduce coverage differentials progressively.

Colombia adopted a universal social insurance plan in the 1990s, with gradual implementation, and reached universal coverage in 2011. This approach combined the contributory plan for the formal sector (including the self-employed) with coverage for the poor and the informal sector. The cost for the subsidized scheme is partly funded through general taxation, with some cross-subsidization from contributions from salaried workers and employers, with a convergence in per capita expenditures between the two sectors (Guerrero, Amaris, and Yerramilli 2013).

Mexico has more recently followed a similar path. The health reform of 2003 led to the Seguro Popular de Salud (SPS), which, by 2012, provided health coverage to more than 52 million Mexicans who had been ineligible for health care through the existing social security systems, with coverage of a progressively expanding number of interventions (Knaul, Chertorivski Woldenberg, and Arreola-Ornelas 2012). The expansion of coverage began with the poorest segments of the population. SPS deliberately built on the platform of the anti-poverty program Oportunidades and enhanced the coverage of a package of covered services for the poor by expanding the package (Frenk 2006; Knaul, González-Pier, and others 2012).

Table 17.1 Summary of Health Insurance Initiatives: China, Colombia, Dominican Republic, Ghana, India, Mexico, Peru, and Thailand

Country (World Bank income group)	Program/legal underpinning	Population coverage	Interventions covered	Percentage of cost covered	Current cancer provisions	Impact
China (upper-middle-income)	<ul style="list-style-type: none"> Launched in early 2000s New Cooperative Medical Scheme (NCMS) Urban Employee Basic Medical Insurance Scheme (UEBMI) Urban Residents Basic Medical Insurance Scheme (URBMI) Medical Financial Assistance Program (MFA) for the poor, covers premiums, extra expenses for programs 1–3 Various directives from the Ministry of Health 	<ul style="list-style-type: none"> 87% coverage in 2008 (72% urban, 93% rural) MFA: 93.37 million poor covered as of 2010 	All included catastrophic diseases	<ul style="list-style-type: none"> Varies by county: 25% to 40% of cost for cancer covered in rural counties UEBMI and URBMI reimburse 70% and 50%, respectively, of inpatient expenditures 	<ul style="list-style-type: none"> Required coverage by catastrophic disease insurance (per Ministry of Health 2012 decree): childhood leukemia, breast cancer, cervical cancer, chronic lymphoid leukemia, lung cancer, esophageal cancer, colon cancer, and rectal cancer 	<ul style="list-style-type: none"> Increased access by NCMS to health services but no improvement of financial protection, potentially because of increasing costs of care Supplementary insurance program too new to be evaluated
Colombia (upper-middle-income)	<ul style="list-style-type: none"> Universal social health insurance system introduced in early 1990s, with two schemes: <ol style="list-style-type: none"> Contributory for formal sector Subsidized for informal sector, unemployed, and poor High-cost subaccount created to pool risk among insurers across entire population 	<ul style="list-style-type: none"> Universal as of 2011 Subsidized plan: 51% Contributory plan: 39% 	<ul style="list-style-type: none"> Child vaccination, cervical cancer screening, hospitalization, chemotherapy, radiotherapy, and most cancer drugs Coverage of catastrophic illness expanded gradually, now including some cancers, with others under consideration 	<ul style="list-style-type: none"> Screening: cervical, breast, prostate, colorectal Treatment: hospitalization; chemotherapy; radiotherapy; and most cancer drugs, including tamoxifen and paclitaxel, rituximab, and trastuzumab 	<ul style="list-style-type: none"> Has protected against catastrophic expenditures (no details in case study) Access still limited: 78% of breast cancers diagnosed in advanced stages 	

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Table 17.1 Summary of Health Insurance Initiatives: China, Colombia, Dominican Republic, Ghana, India, Mexico, Peru, and Thailand (continued)

Country (World Bank income group)	Program/legal underpinning	Population coverage	Interventions covered	Percentage of cost covered	Current cancer provisions	Impact
Dominican Republic (upper-middle-income)	Seguro Familiar de Salud: 2001 (full implementation in 2007) Compulsory, contributory, and subsidized parts	2013: 29% covered by contributory plan, 25% by subsidized plan; intention to reach universal coverage	Explicit and comprehensive package of community and personal health goods and services	<ul style="list-style-type: none"> Up to 1 million pesos/person/year (US\$25,000 in 2013), with 20% to 30% co-payment Contributory scheme: up to US\$2,250 additional for outpatient cancer drugs 	<ul style="list-style-type: none"> Screening: Pap smear and mammography Diagnosis, treatment, physiotherapy, rehabilitation, and palliative care for adult and pediatric cancers 	<ul style="list-style-type: none"> No evaluation; no registry, so not possible to evaluate impact on survival Intended to provide financial protection, but not yet clear whether it has Almost half the population without coverage, so pay out of pocket for all health care
Ghana (lower-middle-income)	National Health Insurance Act (2003) established the National Health Insurance Scheme (NHIS)	<ul style="list-style-type: none"> All eligible, but only 34% enrolled as of 2010 Premiums: sliding scale with no payment from poorest, but not implemented in practice 	Common, relatively inexpensive interventions, but breast and cervical cancer included	<ul style="list-style-type: none"> Breast and cervical cancer, with Parliament considering adding prostate and childhood cancers 	<ul style="list-style-type: none"> Has had relatively little effect on reducing impoverishment caused by medical care In 2005, 45% of financing out of pocket, including for services that should be free 	
India (lower-middle-income)	<ul style="list-style-type: none"> Rashtriya Swasthya Bima Yojana (RSBY) (national) and several similar state programs, for example, in Andhra Pradesh, Karnataka, and Tamil Nadu Rajeev Aarogya Scheme (RAS); 2007, state of Andhra Pradesh, for high-cost treatments mainly for NCDs; contributory health insurance schemes run by RAS for employed people National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke (NPCDCS); 2010 	<ul style="list-style-type: none"> RSBY and RAS-like programs targeted to poorest, with per family per year limits NPCDCS: intention to cover all by 2017; more public health focus, optimized spending on prevention, diagnosis, treatment, and palliation 	<ul style="list-style-type: none"> 100% covered, including premiums Treatment covered up to Rs150,000 (US\$2,430) per family for subsidized coverage Limits higher for contributory schemes 	<ul style="list-style-type: none"> RAS: Some treatments for head and neck cancers, gastrointestinal tract cancers, genitourinary system cancers, gynecological cancers, soft tissue/bone tumors, thoracic and mediastinum cancers, breast cancer, skin cancer, multiple myeloma, hepatoblastoma, Wilms tumor, childhood B-cell lymphomas, AML, ALL, ocular cancers, histiocytosis, and rhabdomyosarcoma Includes palliative care 	<ul style="list-style-type: none"> No evaluation of coverage or financial protection 	

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Table 17.1 Summary of Health Insurance Initiatives: China, Colombia, Dominican Republic, Ghana, India, Mexico, Peru, and Thailand (continued)

Country (World Bank income group)	Program/legal underpinning	Population coverage	Interventions covered	Percentage of cost covered	Current cancer provisions	Impact
Mexico (upper-middle-income)	<ul style="list-style-type: none"> Seguro Popular de Salud (SPS): 2004, for basic package for all not eligible for preexisting coverage through social security (formal sector employees) Fund for Protection against Catastrophic Expenses (FPCE) national program Health Insurance XXI Century (2013), for children under five years of age 	<p>2012: 52 million previously uninsured covered</p>	<p>June 2013:</p> <ul style="list-style-type: none"> Basic package covers 285 interventions FPCE covers 59 interventions for 19 disease groups 		<p>Through FPCE: all childhood cancers and cervical, breast, testicular, prostate, NHL, ovarian, and colorectal cancers</p>	<ul style="list-style-type: none"> Catastrophic spending decrease of more than 20% among SPS enrollees; overall out-of-pocket spending decrease for poorest households 2006–09: increase of treatment of childhood cancers from 3% to 55%; three-year survival, 55% for ALL and 75% for HL Low abandonment rates
Peru (upper-middle-income)	<p>Universal Health Insurance Law (Law 29,344, 2009) with mandatory health insurance for all through one of three plans: contributory, semi-contributory, and subsidized</p>	<p>Plan Esperanza (Project Hope) for cancer to cover all poor and vulnerable</p>	<ul style="list-style-type: none"> Essential Health Plan (no high-cost treatment) for all Health Solidarity Intangible Fund (FISSAL): covers common cancers, ESRD, rare diseases 	<p>No out-of-pocket payment for cancer services</p>	<p>Plan Esperanza (Project Hope), cancer plan: 2012</p> <ul style="list-style-type: none"> All costs covered for select group of cancers: cervix, breast, colon, stomach, prostate, leukemia, and lymphoma Includes health promotion, prevention, early detection, diagnosis, treatment, and palliative care 	<ul style="list-style-type: none"> 21,000 cancers treated in first year at no personal cost for subsidized population Decrease of out-of-pocket costs from 34% in 2012 to 11% in the first trimester of 2013, for those in contributory scheme

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Table 17.1 Summary of Health Insurance Initiatives: China, Colombia, Dominican Republic, Ghana, India, Mexico, Peru, and Thailand (continued)

Country (World Bank income group)	Program/legal underpinning	Population coverage	Interventions covered	Percentage of cost covered	Current cancer provisions	Impact
Thailand (upper-middle-income)	<ul style="list-style-type: none"> 2002: National Health Security Act, establishing the Universal Coverage Scheme (UCS) Prior to 2002: <ol style="list-style-type: none"> Civil Servants Medical Benefits Scheme (CSMBS) Social Security Scheme (SSS) Worker Compensation Scheme (WCS) 	<ul style="list-style-type: none"> UCS: 76% of population covered CSMBS: 7% of population covered SSS and WCS together: 15% of population covered 	UCS: inpatient and outpatient services, such as free prescription medicines, ambulatory care, hospitalization, disease prevention, and health promotion	100% of services covered	<ul style="list-style-type: none"> Cervical cancer screening (Pap smear and VIA): special FFS payment to incentivize use Breast self-examination promotion UCS coverage of radiotherapy and chemotherapy, as well as surgeries and critical care for emergency patients Royal Thai Government issuance of compulsory licenses for four cancer drugs: letrozole, docetaxel, erlotinib, and imatinib 	<ul style="list-style-type: none"> No increase in hospital sales of anti-cancer drugs after five years, despite increases in other NCD drugs (for example, for diabetes, blood pressure, and cholesterol) Screening rates for cervical and breast cancer quite low

Sources: Based on Guerrero, Amaris, and Yerramilli 2013; Knaul, Chertorivski Woldenberg, and Areola-Ornelas 2012; Rathe, Knaul, and Yerramilli 2013; Seinfeld and Pleic 2013; Yerramilli and Ataguba 2013; Yerramilli and Freestone 2013; Yerramilli and Jiang 2013.

Note: ALL = acute lymphoblastic leukemia; AML = acute myeloid leukemia; ESRD = end-stage renal disease; FFS = fee-for-service; HL = Hodgkin's lymphoma; NCD = noncommunicable disease; NHL = non-Hodgkin's lymphoma; VIA = visual inspection with acetic acid.

Peru's Health Insurance Law of 2009 provided coverage for nonsalaried workers through a semi-contributory plan and for the poor through a highly subsidized plan that includes vulnerable groups, such as children and elderly persons. Salaried workers continue to be covered through a preexisting plan (Seinfeld and Pleic 2013).

Similarly, the Dominican Republic introduced a law in 2001 (establishing the Seguro Familiar de Salud) and commenced implementation in 2007, with the aim of comprehensive coverage within a decade. As of 2013, 54 percent of the population had achieved coverage, with slightly over 54 percent of this group in the contributory scheme and the remaining 46 percent in the subsidized scheme (Rathe, Knaul, and Yerramilli 2013).

Many other countries in Latin America and the Caribbean have not yet adopted pro-poor health insurance policies and programs, and coverage remains more segmented.

In the MICs of Asia included in our review, coverage is less complete than in many countries in Latin America and the Caribbean. Singapore, now an HIC, has a scheme with greater reliance on private insurance, including a separate catastrophic insurance scheme (Medishield) in addition to the mandatory regular insurance (Medisave) and the scheme for the poor (Medifund) (Haseltine 2013). The Singapore scheme has been held up as a good example. However, Shanghai briefly experimented with a similar model and discontinued it (Dong 2003). The problems in Shanghai included poor control of incentives for doctors and hospitals to provide expensive treatments and extreme cases where households exhausted the limits of their insurance and were unable to pay hospital bills and bury their deceased relatives. These experiences suggest that what can work in a small, high-income urban country or city is not necessarily replicable in other settings.

Thailand passed the National Health Security Act in 2002, integrating five existing schemes and extending coverage to workers in the informal sector (Yerramilli and Firestone 2013). The scheme covering the poor, the Voluntary Health Card, was expanded following the financial crisis in 1997.

In 2003, the Chinese government began covering rural residents and nonworking urban residents (including students, children, and elderly and disabled persons) by adding programs to existing schemes for urban public and private sector employees. This expansion increased national insurance coverage from 23 percent in 2003 to 87 percent in 2008 (72 percent of urban residents and 93 percent of rural residents) (Yerramilli and Jiang 2013) and to 97 percent by 2011 (Goss and others 2014). The main group remaining uncovered consists of rural migrants to urban areas,

who do not have rights of residence. They are covered by medical insurance in their place of origin but do not have access to doctors where they work (Goss and others 2014). The scheme for the formal sector is financed by payroll taxes; the other schemes require individual fixed contributions, supplemented by contributions from various levels of government. The local autonomy in program design has resulted in some variations in the services covered by county (Yerramilli and Jiang 2013).

In India, as elsewhere, schemes have existed to cover salaried workers and their families. A national scheme for the poor was instituted in 2008, covering treatment up to a relatively low annual expenditure limit. However, there is no national program for informal sector workers. Some states, such as Andhra Pradesh, Karnataka, and Tamil Nadu, have developed schemes with broader entitlement (Yerramilli 2013).

Ghana is one of the few Sub-Saharan African countries with a national health insurance system, which was introduced in 2003. In theory, coverage is comprehensive, with payroll contributions from formal sector workers, contributions from informal sector workers on a sliding scale, contributions from the poor, and exemptions for the core poor (Yerramilli and Ataguba 2013). In practice, informal sector workers pay the minimum contribution and a small percentage of the poor is exempted from contributions. With donor contributions, the scheme ran at a deficit in 2010 and 2011 (Yerramilli and Ataguba 2013). The Ghana case illustrates some of the issues facing ambitious schemes in LMICs.

Health Insurance Coverage by Services and Conditions Covered

The second dimension of coverage is breadth—by services and diseases included. All health insurance schemes have restrictions on which medical services are eligible for coverage; how these are determined crucially affects the equity and efficiency of a health system. Cost-effectiveness, population health needs, and funding should define the package of covered services. In turn, the package defines entitlement, especially once universal enrollment is achieved, which tends to become less restrictive as country income increases. A shallow package, even if it covers a large proportion of the population, is unlikely to offer protection from financial catastrophe or to lower financial barriers to accessing care, particularly for cancer.

Cancer coverage often comes later in the development of these schemes. In LMICs, coverage has tended to start with cancers that affect children and women and that are curable with access and adherence to treatment.

Poor quality of care, incomplete services, or waiting times can force many patients to seek care in the private sector and pay out of pocket, especially for medications, even though these are officially covered by insurance. Because treatment typically involves the repeated use of chemotherapeutic agents, waiting can severely reduce the effectiveness of treatment or block access entirely. Further, the package of covered services may not include components that are important for accessing or managing care, such as transport costs or medications to control symptoms. Similarly, some essential treatments or services (for example, radiotherapy) may be unavailable in the public sector, preventing patients from accessing a complete package of care. This situation can severely reduce the efficacy of the package of provided treatment.

In Colombia, for example, cancer was not included when the program started in 1994. A year later, some cancer interventions were added. Screening for four cancers was added in 2000, radiotherapy was added in 2010, and mammography and breast biopsies were added in 2012. Until 2012, fewer services were covered under the subsidized scheme than under the contributory scheme, and access to treatment has often been an issue because of geographic isolation (Guerrero, Amaris, and Yerramilli 2013).

Mexico has a fund for protection against catastrophic expenses that has gradually covered more cancer interventions since 2003 (Knaul, Chertorivski Woldenberg, and Arreola-Ornelas 2012; Knaul, González-Pier, and others 2012). Initially, coverage was provided for acute lymphoblastic leukemia in children; this coverage has subsequently been extended to certain cervical, breast, and prostate cancers in adults. The package of covered services is based on cost-effectiveness criteria but includes some expensive components (breast cancer treatment, for example, includes trastuzumab for HER2-positive patients).

Peru, which has a separate fund to provide for catastrophic illnesses, launched Project Hope as part of a national cancer plan in 2012 (Seinfeld and Pleic 2013). In the Dominican Republic, coverage of cancer is at an early stage and specifies a fixed per capita sum for financial protection. The more advanced treatments are provided in the private sector; although there is some coverage from the new insurance scheme, co-payments remain relatively high (25–30 percent). New public sector facilities are under development (Rathe, Knaul, and Yerramilli 2013).

In Thailand, the government has aimed to expand access to cancer treatment and, in addition to coverage, has obtained compulsory licenses for four cancer medications: letrozole, docetaxel, erlotinib, and imatinib (Yerramilli and Firestone 2013). Thailand also has

proactive policies to tax alcohol and tobacco; it uses the proceeds to help fund the Thai Health Promotion Foundation (ThaiHealth), which has been involved in comprehensive campaigns to reduce smoking (Yerramilli and Firestone 2013).

China is at an earlier stage of expanding cancer treatment packages. The central government required local schemes to provide coverage for treatment of specified catastrophic illnesses, including six types of cancer, as of February 2013 (Yerramilli and Jiang 2013). However, because medications are not generally covered by insurance, and because of high co-payments, the extent of financial protection remains limited.

Although publicly funded insurance in India, particularly for the poor, is expanding, coverage in practice remains limited. In several states, including Andhra Pradesh, Karnataka, and Tamil Nadu, coverage is limited to third-level care and the treatments included in the packages may not be the most effective or cost-effective for the condition (Yerramilli 2013). Primary and secondary cancer prevention is largely piecemeal and organized by hospitals and nongovernmental organizations. However, a national program that aims to expand access to and coverage of noncommunicable disease prevention, including cancer education and screening, is in the initial stages of implementation (Yerramilli 2013). Several cancer drugs are available at modest cost in India, for historic reasons and because of the large domestic pharmaceutical industry (Goss and others 2014), providing some relief to cancer patients.

In Sub-Saharan Africa, coverage for cancer is more limited still. The Ghana National Health Insurance Scheme is restricted to the more common and inexpensive procedures, and the only cancer coverage is for breast and cervical cancer (Blanchet, Fink, and Osei-Akoto 2012). Ghana signed a memorandum with aid partners in 2007 to commence screening for breast cancer using mammograms; however, this screening program has not yet been implemented (Bosu 2012).

Level of Financial Protection for Cancer Services

The third dimension of coverage is whether (and how much) patients and families contribute out of pocket for services covered. Financial protection—based on prepayment, risk pooling, and public funding for the poor—is a cornerstone of efforts to achieve UHC and is the goal of many health system reforms.

Most countries recognize that public and community health services are of the highest priority and should be universally available and fully and publicly funded. Following experiences with reforms where basic public health services, such as vaccination, suffered because

funding was not explicitly protected (as in Colombia), countries have developed strategies to offer protected financing for all covered interventions in this rubric (Estevez 2012). In Mexico, Seguro Popular includes a separate and protected fund (Knaul, González-Pier, and others 2012). Still, it has been challenging to build into UHC the mechanisms through which these funds grow in tandem with public and community health services, especially with the availability of new interventions to treat or prevent disease. A clear example is the HPV vaccine, which is essential to the future prevention of cervical and several other cancers that are infection associated and much more common in LMICs.

Offering public financing for disease prevention and health-promoting services is important, given the importance of lifestyle and early detection in managing many cancers, including those that most burden LMICs. Patients tend to underuse these services, especially patients who are not fully informed or aware of the risks of unhealthy behavior or late detection; this underuse is exacerbated if they also face significant barriers to access.

Co-payments

The effectiveness of co-payments has been debated for decades, because any degree of co-payment can deter patients from seeking care. Further, implementing exemptions that target the poor sounds simple but, in fact, it is difficult to achieve. For these reasons, many proponents advocate the use of taxes as the more effective and equitable means of generating revenue for financing health. UHC initiatives tend to promote sliding-scale prepayments rather than co-payment at point of service.

Co-payments generally fall as country per capita income increases, but they exist even in HICs. Many LMICs, especially the poorest countries, rely heavily on co-payments. In the LICs of Sub-Saharan Africa—with some notable and recent exceptions, such as Rwanda—public resources for cancer treatment and care are severely limited and co-payments are the norm.

Co-payments often vary by type of service, being smaller (or zero) for services at facilities, but very large (even 100 percent) for medications. In China, the design varies by county, but co-payments of 60–80 percent can be required (Yerramilli and Jiang 2013). Many countries set explicit limits on annual coverage per person or per household (for example, India's national scheme for the poor and China), such that treatment for cancer is likely to exhaust benefits and require large out-of-pocket expenditures.

Thailand is unusual in that services provided by the government sector do not require co-payment, including prescription drugs (Yerramilli and Firestone 2013).

China has begun to identify priority diseases for the reduction of co-payments, focusing on inpatient services. As of 2013, childhood and chronic myeloid leukemia, as well as breast, cervical, lung, esophageal, gastric, and colorectal cancers, were included in these programs (Goss and others 2014).

COVERAGE OF CANCER CARE: EARLY RESULTS

For cancer especially, it takes time for the benefits of improved coverage to translate into increased use of services and then to improvements in health. Unlike adding a vaccination or a medication for an infectious disease, adding cancer services to meet new demand may require new facilities and infrastructure, specially trained medical personnel, and the trust of patients and providers. Without these elements, access to care will not improve, even if it is formally part of an insurance or health care program. We report on a few results of improved coverage that have been recorded in the case study countries.

It is important to note that data on the impacts on health—cancer survival or years of healthy life lived—are almost impossible to obtain for the financing of cancer treatment. In some cases, reforms are too recent to show this degree of impact. In most cases, a major limiting factor is the lack of data in the form of cancer registries and a dearth of formal evaluation efforts.

Outcomes

Improvements in access and financial protection have been documented for the more comprehensive reforms and those of longer duration, although few formal evaluations have assessed health outcomes.

Thailand has made explicit efforts to increase care availability, for example, by issuing compulsory licenses for some cancer drugs, expanding the number of medical school graduates, and offering incentives to doctors to practice in rural areas (WHO 2011b). Thailand also explicitly allocates a fixed per capita amount to prevention, which is given to communities for local efforts, in addition to national programs undertaken by the Thai Health Promotion Foundation (Yerramilli and Firestone 2013). Despite these efforts, less than 20 percent of eligible women have been screened for cervical cancer (Leetongin 2011).

In Mexico, improved coverage has translated to improved survival rates for some pediatric cancers and lower treatment abandonment rates than elsewhere in the region. For breast cancer, the introduction of SPS was associated with reduced treatment

abandonment rates at the National Cancer Institute. Incidence of catastrophic spending has decreased, as has out-of-pocket expenditure by the poor (Knaul, Chertorivski Woldenberg, and Arreola-Ornelas 2012; Knaul, González-Pier, and others 2012).

There is a clear need for evaluation of programs as they mature, measuring health outcomes as well as process outcomes.

Incentives

The design of a financing system may create unintended or intended incentives. In India, the annual cap on payments in the scheme covering the poor means that private cancer care providers have an incentive to move patients to the public sector once the benefits have been exhausted (Yerramilli 2013). In Latin America and the Caribbean, the relatively high payroll taxes on formal sector employment were a concern in the 1980s and blamed for holding down the size of the formal employment sector and increasing informal employment. Similar issues can arise if nonsalaried and own-account workers become entitled to the same health benefits as salaried workers, without being required to pay similar payroll taxes. These pitfalls need to be recognized in system design to meet efficiency needs as well as to improve equity.

In Colombia, the access to and use of health services by the poor have improved (Giedion and Uribe 2009). A concerning development, however, is that patients and their families are successfully suing the government to demand coverage of expensive but ineffective cancer treatments, including those for late-stage cancers (Guerrero, Amaris, and Yerramilli 2013). Open-ended constitutional and programmatic rights, combined with the desperation of patients and families, and the financial benefits for producers of on-patent drugs and expensive services provide strong financial incentives. These costly interventions may deplete available funding for the national cancer fund and undermine the financing of the health system (Guerrero, Amaris, and Yerramilli 2013).

Incentives to provide care are also affected by whether payments to service providers are made on a capitation or fee-for-service basis. Some insurance schemes pay on a fee-for-service basis for interventions that the government wishes to promote, for example, cervical cancer screening in Thailand (Srithamrongswat and others 2010). Private sector providers are reimbursed for other services on a capitation basis, with a global budget ceiling based on Diagnosis Related Groups to contain costs (Garebedian and others 2012). In China in the past, fee-for-service payment provided hospitals with the incentive to offer expensive treatments to end-stage

cancer patients, although the treatments were futile. In the Republic of Korea, fee-for-service payments for screening tests for colorectal cancer are used, but the reimbursement rates are not consistent with the pattern of cost. Reimbursement rates for colonoscopy are set too low relative to fecal occult blood tests, making colonoscopy, on the one hand, more cost-effective than it would otherwise be, but, on the other hand, providing a disincentive for its provision by service providers (Park, Yun, and Kwon 2005).

CONCLUSIONS

In many LMICs, health financing reform efforts have much in common. Key elements include developing contributory and subsidized plans for various population groups, meeting the challenges of incorporating and financing nonsalaried workers and the poor, and building on basic services associated with social welfare programs.

Countries working toward UHC have established universal entitlements to key services through guaranteed benefits packages. The countries are striving to include interventions for common cancers and other chronic and noncommunicable diseases for which there are effective interventions.

Our review of the experiences in several LMICs suggests that these challenges can be met with well-designed financing reform. Prevention, early detection, treatment, and palliative care interventions for cancer can be effectively integrated into basic service packages covered by a combination of social insurance and tax-financed schemes. Invariably, cancer comes after other basic services have been covered, but this can happen relatively quickly—within a decade of program initiation.

In several countries, for example, Mexico and Singapore, specific and distinct funds were established to cover personal health services and catastrophic expenses. In China and India, the design of public insurance provides for some coverage, yet treatment expense ceilings leave the population vulnerable to catastrophic health expenses. Some countries, such as Ghana, have used earmarked taxes or levies to derive resources for health. In all cases, UHC coverage is built up over time, adding covered populations and services and covering a greater proportion of costs, particularly catastrophic costs.

Cancer epitomizes why investment in a systems approach to chronic diseases in LMICs is strategic. The expansion of services and interventions discussed in other chapters can be realized only if countries develop appropriate financing and insurance systems.

Linking each component of the cancer care control continuum in an integrated financing plan is challenging but necessary to guarantee the effectiveness of national cancer programs.

NOTES

World Bank Income Classifications as of July 2014 are as follows, based on estimates of gross national income (GNI) per capita for 2013:

- Low-income countries (LICs) = US\$1,045 or less
- Middle-income countries (MICs) are subdivided:
 - a) lower-middle-income = US\$1,046 to US\$4,125
 - b) upper-middle-income (UMICs) = US\$4,126 to US\$12,745
- High-income countries (HICs) = US\$12,746 or more.

1. This section is based on Atun and Knaul (2012).

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