Chapter 3

Universal Health Coverage and Essential Packages of Care

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INTRODUCTION

Health systems have several key objectives; the most fundamental is to improve the health of the population. In addition, they are concerned with the distribution of health in the population—for example, with health equity—and they strive to be responsive to the needs of the population and to deliver services efficiently (WHO 2007). Notably, they also seek to provide protection against the financial risks that individuals face when accessing health services. Ideally, this financial risk protection (FRP) is accomplished through mechanisms such as risk pooling and group payment that ensure prepayment of most, if not all, health care costs (Jamison and others 2013).

An effective health system is one that meets these objectives by providing equitable access to affordable, high-quality health care—including treatment and curative services as well as health promotion, prevention, and rehabilitation services—to the entire population. Unfortunately, most countries lack health systems that meet this standard. Shortfalls in access, quality, efficiency, and equity have been documented extensively, both in low- and middle-income countries (LMICs) and in some high-income countries (HICs) (WHO 2010). In addition, in many countries, households routinely face catastrophic or impoverishing health expenditure when seeking acute or chronic disease care (Xu and others 2007). These financial risks can result in further health loss and reduced economic prosperity for households and populations (Kruk and others 2009; McIntyre and others 2006).

The current universal health coverage (UHC) movement emerged in response to a growing awareness of the worldwide problems of low access to health services, low quality of care, and high levels of financial risk (Ji and Chen 2016). UHC is now a core tenet of United Nations (UN) Sustainable Development Goal (SDG) 3.[1] UHC was preceded by the aspirational notion of a minimum standard of health for all, enshrined in the Universal Declaration of Human Rights (adopted by the UN General Assembly in 1948) and the declaration of Alma-Ata in 1978, and many HICs have provided universal coverage for decades. The World Health Assembly endorsed the modern concept of UHC as an aspiration for all countries in 2005. Subsequent *World Health Reports* by the World Health Organization (WHO) expanded on various technical aspects of UHC, and in 2015, UHC was adopted as a subgoal (target 3.8) of SDG 3 (UN 2016; WHO 2013b).

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Mechanisms and approaches, summarized elsewhere (WHO 2010; WHO 2013b), have been proposed or attempted as specific means of achieving UHC, but the objectives of UHC are the same in all settings, regardless of approach: improving access to health services (particularly for disadvantaged populations), improving the health of individuals covered, and providing FRP (Giedion, Alfonso, and Díaz 2013). There are three fundamental dimensions to UHC—proportion of population covered, proportion of expenditures prepaid, and proportion of health services included in UHC—that any given health care reform strategy seeks to achieve in some prioritized order (Busse, Schreyögg, and Gericke 2007). Recent reports, including the *Lancet* Commission on Investing in Health and the WHO *Making Fair Choices* consultation, have endorsed a "progressive universalist" approach to public finance of UHC (Jamison and others 2013; WHO 2014).[2] Progressive universalism makes the case, on the basis of efficiency and equity, for an expansion pathway through the three UHC dimensions that prioritizes full population coverage and prepayment, albeit for a narrower scope of services than could be achieved at lower coverage levels or through cost-sharing arrangements. (It has been argued that full population coverage and full prepayment are necessary conditions to ensure that UHC leaves no one behind [WHO 2014].)

If progressive universalism is the preferred approach to UHC, then a critical question for health planners is which health interventions should be included. HICs are able to provide a wide array of health services, but LMICs have the resources to deliver a smaller set of services, necessitating a more explicit and systematic approach to priority setting (Glassman and others 2016). In this spirit, the *Making Fair Choices* report recommended that UHC focus on interventions that are the most cost-effective, improve the health of the worst off, and provide FRP (WHO 2014). The extended cost-effectiveness analysis (ECEA) approach developed for this third edition of *Disease Control Priorities* (*DCP3*) assesses policies in these dimensions and can help identify efficient, fair pathways to UHC. Chapter 8 of this volume provides an overview of ECEA methods and results of ECEAs undertaken in conjunction with *DCP3* (Verguet and Jamison 2018).

The set of prioritized health services publicly financed through a UHC scheme has been termed a *health benefits package* (Glassman and others 2016). The limited experience of LMICs with benefits packages suggests that such packages can be part of a coherent and efficient approach to health system strengthening, but many countries lack the technical capacity to review a broad range of candidate interventions and summarize the evidence for their effectiveness or cost-effectiveness. In this regard, *DCP3* provides guidance on priority health interventions for UHC in LMICs in the form of a model health benefits package that is based on *DCP3*'s 21 essential packages (see chapter 1 of this volume, Jamison and others 2018).

This chapter proposes a concrete set of priorities for UHC that is grounded in economic reality and is intended to be appropriate to the health needs and constraints of LMICs, particularly low-income countries and lower-middle-income countries. It develops a model benefits package referred to as essential UHC (EUHC) and identifies a subset of interventions termed the highest-priority package (HPP). The chapter presents a case that all countries, including low-income countries, could strive to fully implement the HPP interventions by the end of the SDG period (2030), and many middle-income countries could strive to achieve full implementation of EUHC. The chapter also presents estimates of the EUHC and HPP costs and mortality consequences. It concludes with a discussion of measures that improve the uptake and quality of health services and with some remarks on the implications of EUHC and the HPP for health systems.

The chapter does not, however, prescribe one correct approach to UHC, nor does it attempt to review the wide array of delivery mechanisms, policy instruments, and financial arrangements that support the transition to UHC; these have been covered in detail elsewhere (WHO 2010; World Bank 2016). Rather, this chapter stresses that the UHC priority-setting process is contextual, depending on political economy as well as local costs, budgets, and demographic and epidemiological factors—all of which influence the value for money of specific interventions.

Because the development and refinement of a benefits package is an incremental and iterative process, many ministries of health probably will not use *DCP3*'s recommendations as a template for their packages but rather as an aid in reviewing existing services, identifying outliers, and considering services that are not currently provided. The *DCP3* model benefits package can thus serve as a starting point for deliberation on a new health benefits package or refinement of an existing package. However, as construed here, it would not be a perfect package for a particular country. To translate the *DCP3* findings into an actionable UHC agenda at the national or subnational level will require context-specific technical analyses and public consultation, ideally as part of a clearly articulated political agenda and an institutionalized priority-setting process that can govern public and donor resource allocation in the health sector.

FROM ESSENTIAL PACKAGES TO ESSENTIAL UNIVERSAL HEALTH COVERAGE

Development of an Essential UHC Package

Identification of interventions for the HPP and EUHC began by compiling all of the interventions described in *DCP3*'s essential packages. As described in chapter 1 of this volume (Jamison and others 2018), the essential packages of volumes 1 through 9 of *DCP3* contain 327 interventions that have been deemed to accomplish the following:

- Provide good value for money in multiple settings.
- Address a significant disease burden.
- Be feasible to implement in a range of LMICs.

(Note that 119 of the interventions in these essential packages are intersectoral in nature, as discussed in chapter 2 of this volume, Watkins and others [2018]. Some interventions in *DCP3* are not easily classified as health sector or intersectoral; these were generally included in the present chapter as health sector interventions by default. Examples of such interventions include maternal and infant nutrition [that is, food as medicine] and vector control.)

The interventions recommended in these essential packages reflect the synthesis of a wide range of epidemiological and economic evidence instilled with the expert judgment required to extrapolate these findings to settings and policy questions for which data are very limited. Most of the economic evidence takes a health sector perspective on costs and draws on estimates of incremental value for money in settings where the number and scale of current health services are limited. Still, as summarized in chapter 7 of this volume (Horton 2018), the quality and applicability of economic evidence in these studies vary widely, requiring additional deliberation and judgment as described later in this chapter.

Notably, this chapter includes essential packages for two additional groups of conditions: congenital and genetic disorders (annex 3A) and musculoskeletal disorders (annex 3B). These conditions had been treated extensively in *Disease Control Priorities in Developing Countries,* second edition (*DCP2*) (Jamison and others 2006) and were touched upon in various volumes of *DCP3*, but they were deemed not to require dedicated chapters. The essential packages for these two groups of conditions reflect the key messages of the relevant sections of *DCP2*, with updated information on burden of disease and economic evidence in LMICs, particularly over the past decade.

After compiling the contents of *DCP3*'s 21 essential packages, the authors of this chapter took several additional steps to arrive at a final list of EUHC interventions:

- First, instances of duplicate or redundant interventions were removed. Although duplicate interventions were removed in the construction of the EUHC list, each essential package retained all of its interventions.
- Second, the authors worked with the editors responsible for each of these packages to revise intervention descriptions, when needed, to add specificity or clarity for a nonspecialist audience. On the advice of the editors of *DCP3* volumes 4 (Patel and others 2015) and 6 (Holmes and others 2017), only a subset of best-practice interventions from these two volumes was included in the EUHC package. This chapter also aggregated a number of specific health services into single interventions that would always be delivered together in practice, such as screening of at-risk individuals for a given disease plus treatment of individuals who have screened positive for that disease.
- The authors deemed some interventions not to be specific health services but rather measures to increase intervention uptake or quality. These interventions were removed from the EUHC list and are discussed as a group later in this chapter.
- Finally, the authors mapped all interventions to a standard typology of health system platforms that reflects the consensus of editors and members of the *DCP3* Advisory Committee (box 3.1). The grouping of interventions into platforms is intended to illustrate how they could be integrated with each other and within existing health systems.

Annex 3C presents the final contents of the EUHC package, by platform. The EUHC package includes 218 unique interventions, including 13 interventions at the population level, 59 at the community level, 68 at health centers, 58 at first-level hospitals, and 20 at referral and specialized hospitals. Annex 3D, which accompanies annex 3C, examines issues related to specific EUHC interventions. These issues include prices and their impact on cost-effectiveness in cases where prices are rapidly changing, health system requirements such as integration of urgent intervention across delivery platforms, and considerations of feasibility in certain settings.

Identifying a Highest-Priority UHC Package

The EUHC list of 218 unique interventions still constitutes an ambitious agenda for many countries, and achieving full coverage of EUHC by 2030, the end of the

Box 3.1

Defining Delivery Platforms for Essential UHC in *DCP3*: A Standardized Typology

DCP3 volumes 1–9 present interventions in 21 packages tailored to various "platforms," defined as logistically related delivery channels. Thus, a platform is the level of a health system at which interventions can be appropriately, effectively, and efficiently delivered. These platforms, and the interventions that are delivered through them, were determined by the editors of the individual volumes. To compile a single list of unique interventions in Essential Universal Health Coverage and group them by platform, the authors of this chapter harmonized the definitions of the platforms and, in some cases, reallocated interventions to platforms different from those that appeared elsewhere in the *DCP3* volumes.

This platform model is a pragmatic typology rather than a comprehensive description of the myriad health facilities currently serving clients in low- and middle-income countries. Contextual factors, including local culture, disease burden, resources, and geography, will influence both the types of services provided at each level and the way in which patients interact with a health care system. With changes in technology and delivery know-how, it is likely and desirable that existing modalities of health care delivery will evolve and adapt over time. A platform's definition will also evolve as a country's health system becomes more advanced and offers a wider array of health services, particularly at lower levels of the system.

The five platforms of a health system as defined in this chapter are as follows:

Population-based health interventions: This platform captures all nonpersonal or population-based health services, such as mass media and social marketing of educational messages, as typically delivered by public health agencies. (Note that nonhealth-system platforms related to fiscal and intersectoral policies—for example, taxes, subsidies, regulatory policies, and changes in the built environment—are discussed in chapter 2 of this volume [Watkins and others 2018].)

Community services: The community platform encompasses efforts to bring health care services to clients, meeting people where they live. It includes a wide variety of delivery mechanisms. Specific subplatforms include the following:

- Health outreach and campaigns (such as vaccination campaigns, mass deworming, and face-to-face health information, education, and communication)
- Schools (including school health days)
- Community health workers, who may be based primarily in the community but also connected to first-level care providers, with ties to the rest of the system.

Health centers: The health center level captures two types of facility. The first is a higher-capacity health facility staffed by a physician or clinical officer and often a midwife to provide basic medical care, minor surgery, family planning and pregnancy services, and safe childbirth for uncomplicated deliveries. (In annexes 3C and 3F, this sort of health center is denoted with an asterisk.) The second is a lower-capacity facility (for example, health clinics, pharmacies, dental offices, and so on) staffed primarily by a nurse or mid-level health care provider, providing services in less-resourced and often more remote settings.

First-level hospitals: A first-level hospital is a facility with the capacity to perform surgery and provide inpatient care. This platform also includes outpatient specialist care and routine pathology services that cannot be feasibly delivered at lower levels, such as newborn screening. *DCP3* contends that a primary goal for all countries to achieve during the Sustainable Development Goals era could be to ensure most patients have access to fully resourced, high-quality, first-level hospitals—a goal that, although aspirational, could be feasible by 2030.

Referral and specialized (second- and third-level) hospitals: This platform includes general and specialist hospitals that provide secondary and tertiary services.

SDG period, would be challenging for most low-income countries. Further, as has been highlighted throughout *DCP3*, there is great heterogeneity in the strength of evidence and the magnitude of the health impact of these essential interventions.

Some helpful guidance comes from the WHO *Making Fair Choices* consultation, which outlined the principle of priority classes—namely, that health services could be grouped into three classes (high, medium, or low priority) based on their relative merits in the dimensions of cost-effectiveness, priority given to the worse off, and FRP (Chan 2016; WHO 2014). In this spirit, this chapter develops an illustrative HPP that parallels the high-priority class described in *Making Fair Choices*. It looks at the HPP through the lens of low-income countries, taking into consideration their aggregate epidemiological and demographic patterns as well as typical resource constraints.

Identifying the Highest-Priority UHC Interventions: Three Key Dimensions

To identify the subset of EUHC interventions that could be included in the HPP, the authors appraised each EUHC intervention in three dimensions: value for money, priority given to the worse off, and FRP afforded. Annex 3E provides details on the methods and data used in this appraisal process, and annex 3F displays the authors' assessments of each EUHC intervention in these dimensions.

Value for money. To assess value for money, the authors considered cost-effectiveness estimates where cost-effectiveness was a relevant metric of value for money. In these cases, the geometric mean of incremental cost-effectiveness ratios was calculated from the economic evaluation literature in LMICs (see chapter 7 of this volume, Horton 2018). In the cases of EUHC interventions not covered in chapter 7, other databases of cost-effectiveness studies were searched for relevant estimates. The authors also noted the major drivers of cost-effectiveness in cases where interventions would not be uniformly cost-effective in LMICs. These drivers include epidemiological context (such as high- versus moderate-transmission areas for malaria), price variations in key technologies (such as vaccines for which certain countries may be eligible for subsidies), and the quality and generalizability of the cost-effectiveness data. These factors were then synthesized into a summary assessment of cost-effectiveness that placed interventions into one of five categories. Where cost-effectiveness was not a relevant metric of value for money, the appropriate outcome and the efficiency of the intervention in achieving the outcome were noted separately. These issues are noted where pertinent in annexes 3D and 3F.

A few additional remarks should be made on *DCP3*'s shift from the criterion of cost-effectiveness to the broader criterion of value for money. In general, *DCP3* has drawn upon cost-effectiveness or cost-utility analyses to assess interventions that primarily affect health outcomes, including disability and premature mortality. In these cases, referring to the cost-effectiveness of an intervention, measured by cost per adult or child death averted or cost per disability-adjusted life year (DALY) averted, is appropriate. At the same time, several important types of health sector interventions predominantly produce outcomes that are not easily measured in deaths, DALYs, or quality-adjusted life-years (QALYs); these include met need for family planning, reductions in stillbirth rates, palliative care and relief of suffering, and remediation of intellectual losses associated with illness or poor nutritional status. In these cases, metrics such as cost per death or DALY averted do not apply. As a result, the more general term *value for money* is used here to refer to the relative attractiveness of interventions in terms of relevant outcomes. Outside of a benefit-cost analysis framework, the commensurability of different value for money indicators (for example, cost per death averted versus cost per case of met need for contraception) is a matter of judgment and may require further empirical study (see chapter 9 of this volume, Chang, Horton, and Jamison [2018]).

Another limitation of the use of cost-effectiveness and value-for-money criteria is the potential disconnect between modeled estimates and real-world impact. If the quality of care in practice lags what is captured in effectiveness studies, cost-effectiveness ratios will be higher than reported in the literature. Variations in observed clinical practice suggest that differential benefits from health care are likely within and between populations. Unfortunately, the quality of health services in LMICs is an understudied topic and is generally not considered in economic evaluations (Akachi and Kruk 2017; Kruk and others 2017). In the assessments presented in annex 3F, the authors have attempted to account for potential real-world reductions in value-for-money caused by low quality of care, particularly for complex and longitudinal services in low-income countries. (Measures that can ensure the quality of EUHC interventions are discussed later in this chapter.)

Despite all the important limitations discussed above, the *DCP3* perspective is that estimates of cost-effectiveness and value-for-money are critical inputs to the priority-setting process.

Priority given to the worse off. To assess whether an intervention gave priority to the worse off, the authors identified the principal health condition addressed by each intervention. An indicator for the "worse off" was developed that attempted to identify individuals who, by virtue of having a particular disease or injury, would have a much lower level of lifetime health. This indicator was termed "health-adjusted average age of death" (annex 3E). In brief, this measure estimated the additional fatal and nonfatal health loss experienced by an individual affected by a specific cause of death or disability or both, as compared to the average levels of health in the population. In essence, the measure identified causes that would be very severe or result in extremely premature mortality or both. Because the focus of the illustrative HPP is low-income settings, aggregate epidemiological estimates for low-income countries as a group were used as the reference population for constructing this indicator. Estimates of health-adjusted average age of death by cause were assigned to ordinal groups using cutoffs described in annex 3E and then mapped to specific interventions that addressed each cause.

The criterion of priority to the worse off is one variant on the more general notion of "pro-poor" UHC. There is broad agreement that UHC schemes in LMICs should strive first and foremost to serve the needs of marginalized and low-income groups (Bump and others 2016). To accomplish this, some UHC reforms have focused on expanding all health services to the poorest areas, while others have identified interventions against a set of "diseases of poverty" (such as tuberculosis or neglected tropical diseases) as priorities for public finance. Whereas this chapter's approach shares more in common with the latter than the former, it takes a lifecourse perspective on ill health and gives greater weight, for example, to selected noncommunicable diseases (such as schizophrenia, congenital disorders, or childhood cancers) and injuries than might be given within a "diseases of poverty" framework that is oriented to communicable diseases.

Financial risk protection. A qualitative approach was taken to assess FRP. The authors used a composite indicator for FRP derived from expert judgments in three dimensions: (a) likelihood of medical impoverishment in the absence of public finance of the intervention, based on unit cost data; (b) urgency of need for the intervention with unpredictable, severe, acute events generally conferring higher financial risk; and (c) average age of death and level of disability, with more FRP provided by interventions that improve the health of wage earners or address diseases that cause high levels of disability, all else being equal (WHO 2014).

Criteria for Inclusion in the Illustrative Highest-Priority UHC Package

A working concept of the HPP can be defined as the sum of all interventions that meet the following criteria, balanced against each other:

- *Very good value for money in low-income countries.* In cost-effectiveness terms, this is on the order of less than US$5,000–US$7,500 per death averted, depending on average age of death (with a higher willingness to pay for child and adolescent deaths averted), or less than US$200–$300 per DALY averted (or QALY gained). This range of cost-effectiveness values draws from the growing literature on health care opportunity costs, which suggests that a figure approximating half of gross domestic product (GDP) per capita per DALY averted is a realistic level of willingness-to-pay for health care interventions in LMICs (Ochalek, Lomas, and Claxton 2015). (*DCP3* does not explicitly endorse this particular threshold—or the health care opportunity cost approach in general—as a normative one but rather uses it in this chapter as an example of a typical threshold that might be implemented in a highly resource-constrained country.) For interventions where cost-effectiveness is not a relevant metric of value for money, an assessment was made by the authors as to whether the intervention would be likely to efficiently lead to health outcomes important in low-income countries that are not captured in DALYs (for example, averted stillbirths, averted unwanted pregnancies, and provision of palliative care). As a matter of both value for money and ethical obligation, full coverage of basic palliative care services was included in the HPP by default.
- *Priority given to the worst off.* This criterion is met by an intervention being directed against a cause of disease or injury that has a low health-adjusted average age of death.
- *Likely to provide a high degree of FRP.* This criterion is met by an intervention receiving a high score on the composite indicator for FRP.
- *Part of the "grand convergence" agenda proposed by the* Lancet *Commission on Investing in Health.* These interventions—in the domains of reproductive, maternal or neonatal, and child health; human immunodeficiency virus and acquired immune deficiency syndrome (HIV/AIDS); tuberculosis; and malaria—underwent careful scrutiny for this report. They largely overlap with the essential packages of *DCP3* volumes 2 and 6: *Reproductive, Maternal, Newborn, and Child Health* (Black and others 2016) and *Major Infectious Diseases* (Holmes and others 2017), respectively, although they are more selective.

Three additional remarks can be made on the criteria above. First, the exact thresholds for including an intervention in a country's HPP are context specific and should be weighed against social preferences. For instance, how to compare cases of poverty averted to deaths averted is not obvious; UHC priority setting exercises will reasonably differ as to how they weigh health and nonhealth outcomes. A scheme that seeks to prioritize the needs of the poor but is relatively resource-constrained may include more interventions that score high on priority given to the worse off and fall below a strict willingness-to-pay threshold—reflecting high health care opportunity costs. Thus, policy makers may be somewhat less likely to include interventions that provide significant FRP but not much health for money. At the same time, different levels of willingness to pay may be defined for different health outcomes (Cairns 2016); for example, a country that is committed to tackling HIV/AIDS (especially with aid from foreign donors) may decide to include HIV-related interventions despite their being somewhat less cost-effective than interventions for other conditions. *DCP3* does not take a position on the ethics of a choice like this but simply advocates for transparency and public accountability in the priority-setting process (that is, for explicit statements about trade-offs) as well as for consideration of health care opportunity costs (inefficiencies) and the possibility of failure in achieving stated levels of coverage because of budget constraints.

Second, the last criterion listed above is predicated on the analytic work conducted for the *Lancet* Commission on Investing in Health. Before the commission issued its 2013 report, "Global Health 2035: A World Converging within a Generation" (Jamison and others 2013), not all of the interventions included in its "grand convergence" package had the same rigorous evidence of value for money. However, the commission's original analysis deemed them to be effective and important to implement as a package, and their costs and benefits were estimated for the commission as such. Hence, the commission's finding that the grand convergence package was affordable and cost-beneficial influenced this chapter's judgment of the individual interventions' value for money when implemented as part of a package, especially regarding interventions for which other economic evidence was not available.

Finally, it is acknowledged that the design and implementation of the criteria in this chapter required a considerable amount of judgment and de-emphasized quantitative precision and comparability of criteria. To some extent this is an artifact of the *DCP3* process, which is intended to be illustrative rather than prescriptive for a wide range of local contexts. Applying these criteria to specific real-world policy questions would involve (a) gathering more local information on demographics, disease burden, and costs which would influence local estimates of value for money and of who are the "worst off," and (b) conducting local or regional studies that could quantify tradeoffs across each of these criteria, such as the comparability of a child death averted and a case of poverty averted. Empirical advances in these areas could facilitate their incorporation into multi-criteria decision analysis as described by Youngkong (2012) and others.

Interventions that fulfill the criteria above are shown in boldface in annex 3C and also noted alongside the appraisals in annex 3F. In all, 97 of 218 interventions could be classified as high priority according to the four criteria above. Although the proposed HPP includes a preponderance of maternal and child health interventions and interventions against HIV/AIDS and tuberculosis in adults, a significant number of interventions also primarily address noncommunicable diseases (NCDs) and injuries. In terms of the scope of health conditions addressed, these interventions go far beyond the high-priority interventions typically included in the global NCD discourse (WHO 2011).

COSTS OF ESSENTIAL UHC AND THE HPP

Estimating the potential costs and health effects of packages of health interventions is technically challenging in the face of limitations of current data, uncertainty about future demographic and epidemiological patterns, and lack of established methods and tools that span disease groups. This chapter presents estimates of costs and consequences of EUHC and the HPP, treating low-income and lower-middle-income countries in the aggregate. These estimates are not intended to be normative or precise, but rather illustrative of the magnitude and balance of costs and health benefits that a given country might expect.

The authors took a comparative statics approach to estimating cost and health gains from EUHC and the HPP, estimating the change in costs and mortality patterns that would be expected following an instantaneous increase in the coverage of services in the EUHC and HPP lists and holding constant all other factors (for example, demographics, epidemiology, and local prices) that might influence costs. The perspective taken on costs was that of the ministry of health, which was assumed to be the payer for EUHC and the HPP.

For this analysis, "universal" coverage was defined as 80 percent coverage; other groups have chosen targets ranging from 80 percent to 100 percent depending on the costing perspective, intervention, and health

condition (Black and others 2016; WHO 2013a). The rationale for our 80 percent target is that the authors determined it would be unrealistic and infeasible in nearly all cases to achieve greater than 80 percent intervention coverage during the SDG period.

Watkins, Qi, and others (2017) present in detail the methods, data, and assumptions behind this chapter's costing exercise. Costs were decomposed into the following three categories: *direct costs* of service delivery at the point of care—for example, personnel, drugs, and equipment; *costs of facility-level ancillary services* required to deliver these services—for example, rents, building maintenance, and laboratory and radiology services (sometimes referred to as overhead or indirect costs); and *program costs* that support health services but occur above and separate from facility-level costs and are not easily allocable to specific services—for example, administration, logistics, and surveillance activities. We refer to the first category of cost as "service delivery costs" and the second and third categories together as "health system costs."

For each intervention, representative datasets that contained relevant unit cost estimates were identified, and then costs were adjusted to "average" costs in low- and lower-middle-income countries using assumptions about the proportion of health care based on traded goods and, for the nontraded proportion, gradients in health care worker salaries across various countries and between low-income and lower-middle-income countries on average. Care was taken to extract unit cost estimates that reflected long-run average costs. Most unit cost studies included ample detail on service delivery costs but did not factor in health system costs, so these were added as markups on service delivery costs using supplementary datasets and assumptions (Boyle and others 2015, Seshadria and others 2015).

The next step was to identify the population in need of the intervention. Previously published estimates of incidence or prevalence of various causes of disease or injury were compiled and mapped against the EUHC interventions (Vos and others 2016; WHO 2016).[3] In some cases, additional adjustments were made to estimates of population in need; for example, the proportion of the population requiring screening for diabetes (based on risk level) was first estimated and then divided by three to reflect the recommendation for screening once every three years on average. The final step was to estimate current coverage of each intervention using coverage indicators from the WHO Global Health Observatory database or reasonable proxies for coverage (WHO 2016).

As described by Watkins, Qi, and Horton (2017), the authors attempted to quantify major sources of uncertainty in the cost estimates. Three scenarios were defined—base case, worst case, and best case. For a set of key parameters in the costing model, a base case, worst case, and best case value was identified. The overall best and worst case estimates of UHC costs were obtained by simultaneously varying the values of all the key parameters to their most optimistic and pessimistic values, respectively. The point estimates and uncertainty ranges presented subsequently reflect these three scenarios.

Table 3.1 presents potential annual EUHC costs by package, including per capita and total population estimates of current spending, incremental costs, and total costs (that is, the sum of current spending and incremental costs, where total costs reflect 80 percent coverage). The largest single cost component of EUHC is health system costs, comprising about 40 percent of total costs at full coverage. The second largest cost component is the service delivery costs related to the cardiovascular, respiratory, and related disorders package. In both country groups, the service delivery costs related to HIV/AIDS and STIs, malaria, and adult febrile illness were also very high. In lower-middle-income countries, the service delivery costs related to mental, neurological, and substance use disorders were relatively high. It is also noteworthy that the share of incremental costs attributed to NCDs is higher than the share of total costs attributed to NCDs. This finding reflects low levels of current spending on NCDs and suggests that, in order to achieve EUHC, all countries will need to pay particular attention to the incremental investments required to scale up NCD services.

Table 3.2 presents the potential total and incremental annual costs of EUHC and the HPP in low- and lower-middle-income countries, including uncertainty ranges derived from the best- and worst-case scenario analyses described previously. The total cost per person of sustaining the HPP and EUHC at full coverage would be US$42 and US$76, respectively, in low-income countries and US$58 and US$110, respectively, in lower-middle-income countries. Getting to full implementation of the HPP and EUHC would require, annually, an additional 3.1 percent and 6.4 percent, respectively, of current income in low-income countries and 1.5 percent and 2.9 percent, respectively, in lower-middle-income countries.

To put these cost estimates in context, combined annual per capita health expenditure by government and donors in low- and lower-middle-income countries is currently US$25 and US$31, respectively, with out-of-pocket spending by the population being about as large again (WHO 2016). Assuming that the objective of UHC is to successfully crowd out out-of-pocket spending at the point of care through prepayment mechanisms and

Table 3.1 Costs of Essential UHC in Low-Income and Lower-Middle-Income Countries, by *DCP3* Intervention Package

	Current annual spending, per capita	Current annual spending, population (US$ billions)	Incremental annual cost, per capita[a]	Incremental annual cost, population (US$ billions)[a]	Total annual cost, per capita[b]	Total annual cost, population (US$ billions)[c]	Share of total costs (%)[d]
Panel a. Low-income countries							
Age related							
1. Maternal and newborn health (MNH)	$1.3	$1.2	$1.8	$1.6	$3.1	$2.8	6.1
2. Child health (CHH)	$2.3	$2.1	$1.2	$1.0	$3.4	$3.1	6.7
3. School-age health and development (SAH)	$0.094	$0.085	$0.20	$0.18	$0.30	$0.27	0.58
4. Adolescent health and development (AHD)	$0.31	$0.28	$0.44	$0.40	$0.75	$0.68	1.5
5. Reproductive health and contraception (RHC)	$0.82	$0.74	$0.38	$0.34	$1.2	$1.1	2.3
Infectious diseases							
6. HIV and STIs (HIV)	$3.6	$3.2	$4.0	$3.6	$7.6	$6.8	15
7. Tuberculosis (TB)	$0.34	$0.31	$0.15	$0.13	$0.49	$0.44	0.95
8. Malaria and adult febrile illness (MAL)	$2.4	$2.1	$2.6	$2.4	$5.0	$4.5	9.7
9. Neglected tropical diseases (NTD)	$0.33	$0.30	$0.31	$0.28	$0.63	$0.57	1.2
10. Pandemic and emergency preparedness (PAN)	$0.016	$0.014	$0.71	$0.63	$0.75	$0.68	1.5
Noncommunicable disease and injury							
11. Cardiovascular, respiratory, and related disorders (CVD)	$0.67	$0.60	$13	$11	$13	$12	26
12. Cancer (CAN)	$0.21	$0.19	$2.5	$2.2	$2.7	$2.4	5.2
13. Mental, neurological, and substance use disorders (MNS)	$0.49	$0.44	$1.8	$1.6	$2.3	$2.1	4.5
14. Musculoskeletal disorders (MSK)	$0.75	$0.67	$1.2	$1.1	$1.5	$1.4	3.0

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Table 3.1 Costs of Essential UHC in Low-Income and Lower-Middle-Income Countries, by *DCP3* Intervention Package (continued)

	Current annual spending, per capita	Current annual spending, population (US$ billions)	Incremental annual cost, per capita[a]	Incremental annual cost, population (US$ billions)[a]	Total annual cost, per capita[b]	Total annual cost, population (US$ billions)[c]	Share of total costs (%)[d]
15. Congenital and genetic disorders (CGD)	$0.59	$0.53	$1.2	$1.1	$1.8	$1.7	3.6
16. Injury prevention (IPR)	$0.0044	$0.0039	$0.039	$0.035	$0.044	$0.039	0.085
17. Environmental improvement (ENV)	$0.050	$0.045	$0.049	$0.044	$0.10	$0.089	0.19
Health services							
18. Surgery (SUR)	$1.6	$1.5	$1.3	$1.1	$2.9	$2.6	5.6
19. Rehabilitation (RHB)	$0.10	$0.089	$1.5	$1.3	$1.6	$1.4	3.1
20. Palliative care and pain control (PCP)	$0.11	$0.10	$1.6	$1.5	$1.7	$1.6	3.4
21. Pathology (PTH)	$0.71	$0.64	$1.8	$1.7	$2.6	$2.3	5.1
Totals							
Total service delivery costs (sum of costs by package)	$16	$14	$36	$32	$51	$46	
De-duplicated service delivery costs	$12	$11	$31	$28	$43	$39	60
Total health system costs	$7.9	$7.1	$20	$18	$29	$26	40
Total cost (sum of service delivery and health systems)[c]	$20	$18	$51	$46	$72	$65	100

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Table 3.1 Costs of Essential UHC in Low-Income and Lower-Middle-Income Countries, by *DCP3* Intervention Package (continued)

	Current annual spending, per capita	Current annual spending, population (US$ billions)	Incremental annual cost, per capita[a]	Incremental annual cost, population (US$ billions)[a]	Total annual cost, per capita[b]	Total annual cost, population (US$ billions)[b]	Package share of total costs
Panel b. Lower-middle-income countries							
Age related							
1. Maternal and newborn health (MNH)	$1.6	$4.4	$2.1	$5.5	$3.7	$9.9	5.3
2. Child health (CHH)	$3.0	$8.1	$0.99	$2.6	$4.0	$11	5.8
3. School-age health and development (SAH)	$0.083	$0.22	$0.21	$0.57	$0.29	$0.79	0.42
4. Adolescent health and development (AHD)	$0.37	$0.99	$0.53	$1.4	$0.90	$2.4	1.3
5. Reproductive health and contraception (RHC)	$1.6	$4.4	$0.45	$1.2	$2.1	$5.6	3.0
Infectious diseases							
6. HIV and STIs (HIV)	$2.6	$7.0	$4.1	$11	$6.7	$18	9.6
7. Tuberculosis (TB)	$0.34	$0.91	$0.19	$0.50	$0.53	$1.4	0.76
8. Malaria and adult febrile illness (MAL)	$4.1	$11	$2.3	$6.2	$6.4	$17	9.1
9. Neglected tropical diseases (NTD)	$0.37	$1.0	$0.39	$1.0	$0.74	$2.0	1.1
10. Pandemic and emergency preparedness (PAN)	0.094	0.25	$0.66	$1.8	$0.75	$2.0	1.1
Noncommunicable disease and injury							
11. Cardiovascular, respiratory, and related disorders (CVD)	$9.4	$25	$15	$40	$24	$65	35
12. Cancer (CAN)	$0.64	$1.7	$1.8	$4.7	$2.4	$6.4	3.5
13. Mental, neurological, and substance use disorders (MNS)	$1.8	$4.8	$3.7	$9.8	$5.47	$15	7.8
14. Musculoskeletal disorders (MSK)	$1.1	$3.0	$2.1	$5.6	$2.8	$7.5	4.0
15. Congenital and genetic disorders (CGD)	$0.74	$2.0	$1.3	$3.5	$2.0	$5.4	2.9
16. Injury prevention (IPR)	$0.021	$0.055	$0.11	$0.30	$0.13	$0.36	0.19
17. Environmental improvement (ENV)	$0.11	$0.30	$0.10	$0.26	$0.16	$0.42	0.23

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Table 3.1 Costs of Essential UHC in Low-Income and Lower-Middle-Income Countries, by *DCP3* Intervention Package (continued)

	Current annual spending, per capita	Current annual spending, population (US$ billions)	Incremental annual cost, per capita[a]	Incremental annual cost, population (US$ billions)[a]	Total annual cost, per capita[b]	Total annual cost, population (US$ billions)[b]	Package share of total costs
Health services							
18. Surgery (SUR)	$1.6	$4.2	$0.97	$2.6	$2.6	$6.8	3.7
19. Rehabilitation (RHB)	$0.41	$1.1	$2.9	$7.6	$3.3	$8.7	4.7
20. Palliative care and pain control (PCP)	$0.071	$0.19	$0.50	$1.3	$0.57	$1.5	0.81
21. Pathology (PTH)	$1.0	$2.6	$2.1	$5.6	$3.6	$9.7	5.2
Totals							
Total service delivery costs (sum of costs by package)	$30	$81	$40	$110	$70	$190	
De-duplicated service delivery costs	$16	$44	$35	$93	$60	$160	60
Total health system costs	$11	$29	$23	$62	$40	$110	40
Total cost (sum of service delivery and health systems)[c]	$27	$73	$58	$160	$101	$270	100

Source: Watkins, Qi, and others 2017.

Note: All dollar amounts are in U.S. dollars. *DCP3 = Disease Control Priorities*, third edition; HIV = human immunodeficiency virus; STIs = sexually transmitted infections; UHC = universal health coverage.

a. Incremental cost of scaling is from current coverage to 80 percent coverage.

b. Cost is at 80 percent coverage.

c. Total costs are the sum of "de-duplicated service delivery costs" and "total health system costs." The de-duplicated service delivery costs are lower than the total service delivery costs because a number of interventions are included in more than one *DCP3* essential package.

d. Two types of shares are presented in this column. First, the shares of costs presented for each of the 21 essential packages use, as the denominator, the de-duplicated service delivery costs, so the sum of these shares exceeds 100 percent because of duplication; however the share of any given package can be interpreted as the remaining fraction of the total EUHC service delivery cost if the interventions in all other packages were removed. Second, the shares of costs presented in the totals section reflect the relative proportion of EUHC costs related to service delivery and to health system strengthening, with the sum of these two being the total cost of EUHC.

Table 3.2 Total and Incremental Annual Costs of Essential UHC and the Highest-Priority Package (HPP) in 2015

	Low-income countries		Lower-middle-income countries	
	HPP	EUHC	HPP	EUHC
1. Incremental annual cost (US$ billions)[a]	23 (9.2 to 51)	48 (20 to 100)	82 (32 to 180)	160 (66 to 350)
2. Incremental annual cost per person (US$)	26 (10 to 57)	53 (22 to 110)	31 (12 to 67)	61 (25 to 130)
3. Total annual cost (US$ billions)[a]	38 (19 to 71)	68 (34 to 130)	160 (81 to 280)	280 (150 to 500)
4. Total annual cost per person (US$)	42 (21 to 79)	76 (37 to 140)	58 (30 to 100)	110 (54 to 190)
5. Incremental annual cost as a share of current GNI (%)[b]	3.1 (1.2 to 6.9)	6.4 (2.6 to 13)	1.5 (0.57 to 3.2)	2.9 (1.2 to 6.2)
6. Total annual cost as a share of current GNI (%)[b]	5.1 (2.5 to 9.5)	9.1 (4.5 to 17)	2.8 (1.4 to 4.8)	5.2 (2.6 to 9.1)

Source: Watkins, Qi, and others 2017.

Note: EUHC = Essential Universal Health Coverage; GNI = gross national income; UHC = Universal Health Coverage. Incremental annual cost is the estimated cost of going from current to full implementation (80 percent population coverage) of the EUHC and HPP interventions. The total annual cost is the incremental cost plus current spending assuming the same cost structure for current and incremental investments. Estimated costs are inclusive of estimates for (large) health system strengthening cost and are steady-state (or long-run average) costs in that investments to achieve higher levels of coverage and to cover depreciation are included.

a. The 2015 population of low-income countries was 0.90 billion. For lower-middle-income countries, it was 2.7 billion. Population sizes were estimated using data from UN DESA 2017 according to the country classifications listed at the end of this chapter.

b. The 2015 GNI of low-income countries was $0.75 trillion and for lower-middle income countries it was $5.4 trillion. Aggregate GNI figures were estimated using data from the World Bank.[4]

pooled contributions, these cost estimates suggest that current government and donor spending will need approximately to double or triple to finance the HPP or EUHC packages. These implied shortfalls are comparable to a recent costing exercise in Ethiopia (Ethiopia, Ministry of Health 2015) that estimated that a 30–80 percent increase in available resources would be required to finance universal coverage of a very basic package of essential health services in Ethiopia.

The incremental cost of reaching full coverage is significant; probably feasible in lower-middle-income countries but unlikely to be feasible in low-income countries without additional external support. For comparison, the annual incremental cost of the *Lancet* Commission on Investing in Health's grand convergence package was about 1 percent of current per capita income overall as compared to 2–3 percent of current per capita income in this chapter's HPP (Jamison and others 2013). The higher cost of *DCP3*'s HPP results from the inclusion of a wider scope of interventions, including both the reproductive, maternal, neonatal, and child health interventions in the *Lancet* Commission on Investing in Health package and additional interventions for major infectious diseases in adults and substantial investments in NCDs and injury care at health centers and first-level hospitals.

Finally, *DCP3*'s cost estimates are in line with those estimated by others. Earlier work based on the WHO Commission on Macroeconomics and Health and the High Level Taskforce for Innovative International Financing of Health Systems suggested that the minimum total annual public expenditure on UHC in LMICs would need to be about US$86 per capita or 5 percent of current GDP per capita, whichever is larger (McIntyre, Meheus, and Rottingen 2017). A more recent costing exercise by WHO has suggested that the incremental annual public expenditure on UHC in LMICs would need to be US$58 (ranging US$22–US$167) per capita (in 2014 U.S. dollars) across LMICs in order to achieve full implementation by 2030 (Stenberg and others 2017). (The WHO study only reported incremental costs, not total costs. Watkins, Qi, and others [2017] compare the contents of the WHO's package and *DCP3*'s EUHC and HPP.) Taken together, these figures also suggest that, if resources for UHC do not increase in low-income countries, even the HPP—however attractive on health and efficiency grounds—would need to be significantly reduced in scope.

HEALTH CONSEQUENCES OF ESSENTIAL UHC AND THE HPP

Watkins, Norheim, and others (2017) present in detail the data sources, methods, and assumptions that are used to estimate the mortality impact of EUHC and the HPP. In brief, the overall framework for the impact assessment was the supplementary SDG 3 target proposed by Norheim and others (2015) of a 40 percent reduction in deaths under age 70 years by 2030. This chapter projects total deaths in 2030—by age group, gender, and cause—using UN Population Division estimates of population size (UN DESA 2017) and cause-specific mortality rates (by age group and gender) using the WHO's most recent Global Health Estimates database (Mathers and others 2018)

Estimates of mortality reduction from specific HPP and EUHC interventions implemented a hybrid approach. For under-five years, maternal, HIV/AIDS, and tuberculosis deaths, the analysis drew on the impact modeling undertaken for the Commission on Investing in Health (Boyle and others 2015). For NCDs and injuries, as well as for selected causes of death from infectious disease in adults, the authors identified a subset of interventions for which there was strong evidence for a large relative effect on cause-specific mortality. These relative reductions in mortality were then applied to cause-specific mortality rates, focusing on deaths in the groups ages 5–69 years. The impact estimates were then adjusted to reflect the proportion of deaths that would be affected by an increase in intervention coverage. Effect sizes were also adjusted downward to account for suboptimal quality of delivery, including imperfect adherence. The adjusted effect sizes were then applied to projected 2030 estimates of deaths, by cause, in low-income and lower-middle-income countries.

Table 3.3 presents these estimates of the potential mortality consequences of the HPP and EUHC in 2030. They can be regarded as conservative estimates: other EUHC and HPP interventions can reduce mortality as well as disability (the latter of which is not the focus of this analysis). A subset of NCD interventions also reduces mortality over the age of 70 years, although these deaths are not counted toward the target. Finally, many EUHC and HPP interventions have well-known nonhealth benefits, such as increased productivity, educational attainment, economic benefits to women resulting from reduced fertility rates, and so on, that make the suite of societal benefits of UHC even larger.

The impact estimates in table 3.3 suggest that HPP and EUHC implementation will facilitate substantial progress toward the SDG 3 target in both low-income and lower-middle-income countries, with relatively more progress in low-income countries. However, at 80 percent coverage and usual levels of delivery quality, the HPP and EUHC would achieve roughly half and two-thirds, respectively, of the mortality reduction target.

There are two sets of factors that influence the shortfall in mortality reduction. First, 80 percent is a particularly modest target for some conditions, such as childhood illnesses and HIV/AIDS and tuberculosis among adults. Scaling up the child health and infectious diseases packages to 95% or higher coverage, with more optimistic assumptions about the quality of delivery, would facilitate countries reaching the mortality target at least for these conditions. Second, lower-middle-income countries face greater challenges in reaching the target because of the predominance of noncommunicable diseases and injuries. The HPP and EUHC interventions for these conditions, particularly for neoplasms, are relatively less effective even at high levels of coverage. In addition, these countries face demographic and epidemiologic headwinds, with greater increases in total deaths and in the share of projected deaths in 2030 due to noncommunicable diseases and injuries. The findings of this analysis suggest that, particularly in lower-middle-income countries, meeting the target will be feasible only if health sector interventions against NCDs and injuries are complemented by strong intersectoral policies such as tobacco taxation and control, reduction of air pollution, and road safety that can reduce the risk of incidence of fatal and nonfatal NCDs and injuries. These sorts of interventions are addressed in greater detail in chapter 2 of this volume (Watkins and others 2018).

IMPLEMENTING ESSENTIAL UHC

The primary focus of this chapter and of *DCP3* as a whole has been to develop detailed essential packages of care. At the same time, the interventions contained in EUHC and the HPP would translate to gains in population health only through expanded uptake and improved efficiency and quality of health care (figure 1.1 in chapter 1 of this volume, Jamison and others 2018). Further, EUHC and the HPP require health systems that have adequate human and material resources to deliver a wide range of services. This section of the chapter discusses some important considerations for implementing EUHC and the HPP. These include reducing barriers to the uptake of priority health services, improving the quality of services provided, strengthening the building blocks of health systems, and supporting the institutionalization of priority setting.

Table 3.3 Premature Deaths Averted in 2030, by Age Group and Cause, through Full Implementation of EUHC and the HPP, Low-Income and Lower-Middle-Income Countries

Age group or condition	Low-income countries[b]				Lower-middle-income countries[b]			
	Projected number of premature deaths, 2030[a]	40x30 reduction target[c]	Expected reduction in premature deaths from		Projected number of premature deaths, 2030[a]	40x30 reduction target[c]	Expected reduction in premature deaths from	
			HPP	EUHC			HPP	EUHC
By age group								
0–4	2.2	1.5	0.62	0.77	3.3	2.2	1.1	1.3
5–69	5.2	1.5	0.99	1.2	14	4.8	2.2	2.9
0–69	**7.4**	**3.0**	**1.6**	**2.0**	**17**	**7.0**	**3.2**	**4.2**
By cause (age 5+)[d]								
I. Group I	**1.9**	**0.76**	**0.59**	**0.65**	**3.2**	**1.5**	**0.85**	**0.94**
Tuberculosis	0.34	0.22	0.11	0.13	0.90	0.60	0.29	0.35
HIV/AIDS	0.44	0.29	0.18	0.20	0.48	0.32	0.23	0.26
Malaria	0.087	0.058	0.051	0.051	0.055	0.037	0.026	0.026
Maternal conditions	0.17	0.11	0.075	0.086	0.20	0.13	0.079	0.092
Other diseases	0.90	0.074	0.18	0.18	1.6	0.40	0.22	0.22
II. Group II	**2.5**	**0.60**	**0.36**	**0.53**	**8.9**	**2.7**	**1.3**	**1.9**
Neoplasms	0.65	0.22	0.010	0.039	1.8	0.60	0.10	0.16
Cardiovascular diseases	0.93	0.31	0.24	0.36	4.0	1.3	0.89	1.4
Other diseases	0.93	0.076	0.11	0.13	3.2	0.80	0.28	0.35
III. Group III	**0.77**	**0.13**	**0.043**	**0.060**	**2.0**	**0.54**	**0.070**	**0.10**
Road injuries	0.25	0.085	0.032	0.046	0.57	0.19	0.048	0.069
Other injuries	0.52	0.042	0.010	0.014	1.4	0.36	0.022	0.032

Source: Watkins, Norheim, and others 2017.

Note: All estimates are in millions of deaths. The 40x30 reduction target includes a 40 percent reduction in deaths 0–69 overall; a two-thirds reduction in under-five deaths and adult deaths from tuberculosis, HIV/AIDS, malaria, and maternal conditions; and a one-third reduction in deaths from major noncommunicable diseases. The quantitative targets above reflect these goals; however, targets for the residual categories ("other diseases" and "other injuries") have been calculated in light of the targets for specific causes of death so that the total number of target deaths 5–69 is sufficient to meet the 40 x 30 target.

a. A death under age 70 years is defined as premature.

b. See unnumbered endnote for World Bank classification of countries by income group. UN and WHO data were aggregated according to these groupings.

c. A reduction target of 40 x 30 is defined as a 40 percent reduction in premature deaths by 2030, relative to the number that would have occurred had 2015 death rates persisted to 2030. The *UN Population Prospects* (UN DESA 2017) median population projection for 2030 was used to provide the population totals for calculating deaths by age and sex.

d. WHO's Global Health Estimates (Mathers and others 2018) provided the 2015 cause distributions of deaths for these calculations.

Reducing Barriers to Intervention Uptake

Ng and others (2014) have proposed the concept of "effective coverage" as a quantitative indicator of the effect of UHC. The concept goes beyond the usual notion of coverage, which is often measured as the probability that specific health services are available at a given facility. Effective coverage, in contrast, incorporates measures of intervention uptake by those in need as well as measures of the quality of the care provided, and thus it considers the actual health gain that an intervention is likely to produce in the population. Although the use of quantitative indicators for UHC continues to stimulate international debate, the principle that the health impact of UHC is bounded by effective coverage—constraints on access to and quality of care—is intuitive. Hence, a UHC scheme and associated package can truly claim to be "universal" only once full *effective* coverage has been achieved.

Removing or reducing key barriers to intervention uptake is crucial to achieving full effective coverage. Barriers to intervention uptake fall into four broad types: economic, geographic, sociocultural, or legal.

Economic barriers feature prominently in the UHC discourse, and they can be partially remediated through public finance. Still, public finance usually addresses only the direct cost of care. Direct nonmedical costs such as transportation and food expenses that are borne by individuals are not easily remedied by prepayment, nor are the economic consequences of taking time off work or school to receive care. Despite currently limited evidence, these sorts of barriers may be more amenable to intersectoral action (for example, paid sick leave and subsidized public transportation for visits to health facilities) than to changes in the delivery or financing of health care. In addition, social development policies and other approaches complementary to public finance may be needed to improve access to marginalized groups, particularly in countries with high levels of political, economic, and social inequality. Ideally, health insurance should be integrated with broader social protection measures that are implemented outside the health sector. At a minimum, the spirit of the progressive universalist approach to UHC implies that user fees should be reduced as much as possible or eliminated entirely, and in some cases, additional steps—such as cash transfers or other financial incentives for the poor—could be considered.

Geographic barriers arise when the distribution of health facilities does not match the distribution of the population's health needs. The EUHC package's platform structure allows health planners to identify what sorts of health facilities are most needed and what sort of capacity is required at those facilities. In general, longitudinal interventions (such as chronic management of HIV/AIDS) and acute care interventions (such as fracture reduction and fixation) need to be decentralized as much as possible because of the frequency or urgency of contact with the health system. Such services, which make up nearly 75 percent of the recommended EUHC interventions, require highly decentralized facilities at high density in communities, including in hard-to-reach populations, to reach universal coverage. The interventions on the community, health center, and first-level hospital platforms can build a foundation for efficient primary health care (annex 3C). At the same time, routine, one-off services (such as immunization programs or cataract surgery) can often be efficiently delivered through stand-alone, targeted programs appropriate to the epidemiology of the country or region (Atun and others 2010). Finally, complex, high-risk services (such as chemotherapy treatment of childhood leukemia) generally need to be centralized, with strong referral systems, to ensure sufficient quality.

Sociocultural and legal barriers, which may be intertwined in cause and effect, vary according to both the characteristics of the intervention and the country context. Disease stigma may influence individuals' willingness to seek care or—consciously or unconsciously—providers' attitudes toward these individuals. Low knowledge or health literacy can also impede intervention uptake, and this has been a major focus of information, education, and communication interventions. Finally, there may be legal barriers to care, or mandates to provide certain kinds of care, that have little to do with stigma or culture. For example, restrictions on prescribing by nurses or midlevel practitioners may reduce the opportunities for individuals with chronic illness to receive needed medications.

Table 3.4 provides examples from *DCP3* of measures that have been used to expand access to care, either by reducing access barriers or by inducing demand for health care.

Improving the Quality of Essential UHC

In addition to affordability and availability, the quality of services is also critical to the success of UHC schemes. If users do not perceive services as valuable, public support will falter, undermining the politics of implementing UHC (Savedoff and others 2012). Low quality of care can thus reduce the positive health impact of otherwise effective and cost-effective interventions. From an economic standpoint, low quality suggests that more money needs to be spent on a health service than the estimates of cost-effectiveness would imply. As discussed in

Table 3.4 Selected Examples of Measures to Address Barriers to Health Care Access, LMICs

Barrier type	Examples
Economic	Bus fares to support attendance at STI clinics
	Conditional cash transfers for antenatal care
Geographic	Decentralization of chronic disease care, for example, for HIV and diabetes
	Extension of antenatal care using community health workers
	Mobile units to provide screening and care for HIV and tuberculosis
Sociocultural	Information and education about cervical cancer and the benefits of screening
	Ensuring that health care providers of the same sex are available when requested
	Educational campaigns to reduce stigma concerning mental health
Legal	Easing legal restrictions on access to family planning measures
	Legal measures to ensure confidential reporting of and care following episodes of intimate partner violence

Sources: Black and others 2016; Gelband and others 2015; Patel and others 2015; Prabhakaran and others 2017; Holmes and others 2017.
Note: LMICs = low- and middle-income countries; STI = sexually transmitted infection.

chapter 10 of this volume (Peabody and others 2018), health planners can improve outcomes and reduce inefficiency in spending on the UHC intervention package by integrating into routine health care four types of measures that ensure high quality:

- Measuring activities and providing feedback
- Identifying relevant standards for these measures using scientific evidence, guidelines, and best practices
- Ensuring that providers are adequately trained to deliver the intervention with adequate management and oversight
- Motivating and aligning providers through incentives, which may be either financial (such as results-based financing) or nonfinancial (such as reputation enhancement among peers).

In some cases, investments in improving quality can translate to improvements in health over a shorter time frame than introducing a new health technology or policy. Costs related to quality improvement are covered in the EUHC and HPP cost estimates as part of health system costs (see table 3.1). The following are some examples from *DCP3* of measures that have been used to improve the quality of care for specific health conditions:

- Clinical checklists for complex tasks such as surgical procedures
- Hospital infection control policies and procedures
- Clinical guidelines for specific syndromes or diseases, including guidance on reducing unnecessary antibiotic use
- National essential medicines and diagnostics lists and formularies
- Use of community health workers and technologies (such as mHealth) to promote medication adherence
- Creation of high-volume, specialized centers to deal with complex but not urgent problems
- Adequate control of pain, including pain related to acute injuries or severe life-limiting illnesses.

Implications of EUHC for the Building Blocks of Health Systems

Once consensus has been reached on a health benefits package such as the HPP or EUHC, with political and public buy-in, the next step would be to implement this agenda within the context of the current health system. Using the WHO health systems framework (WHO 2007) as a point of reference, the most critical implications of the EUHC package for health systems can be identified, particularly leadership and governance challenges, UHC financing issues, health workforce constraints, gaps in medical product and technology availability, and limited information and research functions.

Leadership and Governance

A recent case series of early-adopter UHC countries highlighted the importance of leadership and governance as well as the strategic use of social and economic crises as opportunities for moving forward with UHC reforms (Reich and others 2016). National UHC plans and strategies would rely on strong regulatory measures and bureaucracy. As mentioned, well-considered management of private interests and agendas (such as donors, industries, and advocacy groups) can help ensure

that an economically efficient and equitable form of UHC moves forward. At the same time, mechanisms for feedback and response can ensure that governments are accountable to constituents (Kieslich and others 2016).

In addition, management competence at a subnational level is incredibly important in ensuring that health services are delivered effectively. In particular, large clinics and first-level and referral hospitals require robust administrative capacity and health information management systems. A variety of studies have demonstrated that the quality of management is critical to the delivery of high-quality health services (Mills 2014).

UHC Financing

Issues around financing UHC have been reviewed by others and are not treated in detail here (WHO 2010; World Bank 2016). Nevertheless, it is important to recognize that all early-adopter countries, regardless of income level, have faced challenges in raising sufficient public revenues for UHC (Reich and others 2016). This chapter provides some general conclusions on the likely magnitude of UHC costs (table 3.2), which in most countries suggests a need for increases in both total health expenditure and the government's share of total health expenditure. Conversely, the HPP would need to be reduced substantially or disinvestment in interventions would be needed if resource levels could not be increased. This costing exercise also suggests that many low-income countries would need to continue relying on development assistance for health as a supplement to public finance for priority conditions, such as HIV/AIDS. Notably, countries from around the world have successfully employed a wide range of public, private, and hybrid financing models to achieve UHC (Reich and others 2016). Financing models are usually path dependent, but the key objective in any case is to divert out-of-pocket payments into pooled and prepayment mechanisms and to establish fairness in risk pooling. In addition, measures such as price negotiation with industry and local health technology assessment are crucial to managing cost escalation and maximizing efficiency of public expenditure (Nicholson and others 2015).

Health Workforce

Short- to medium-run constraints on the health workforce are probably among the most important bottlenecks in implementation of UHC reforms (Reich and others 2016; Stenberg and others 2017). *DCP3* has highlighted numerous examples of task sharing that allow for broader coverage of essential health services, such as the use of midlevel providers and general physicians for basic first-level hospital surgical procedures (Mock and others 2015). At the same time, as health systems become more complex and oriented toward management of NCDs, specialized systems and providers will also be required in many cases (Samb and others 2010). The EUHC and the HPP interventions include a limited number of specialized and referral services that reflect these future needs, but the human and material resources required to deliver these services at any reasonable level of coverage can take years to develop. Hence, low-income countries could consider adding capacity for specialized services that provide good value for money, such as specialized surgery and cancer centers (Gelband and others 2015; Mock and others 2015), as a first step during the SDG period toward more advanced, comprehensive health systems.

Medical Product and Technology Availability

Implementing EUHC will also require greater availability of existing medical products and technologies. Problems and proposed solutions to gaps in access to essential medicines have been reviewed by others and are not dealt with here (Howitt and others 2012; Wirtz and others 2017). However, *DCP3*'s model benefits packages could provide a useful input to the revision of national formularies and essential medicines lists. Procurement bodies and local agencies that regulate and manage supply chains could then be strengthened along the lines of these essential medicines so that they reach the last mile and make UHC truly universal. Additionally, *DCP3* has stressed the importance of using generic medications throughout (Patel and others 2015; Prabhakaran and others 2017). Generic medications nearly always have equivalent clinical effectiveness and can be a major factor ensuring the affordability and sustainability of UHC.

Information and Research

As critical as information and research are to health systems, they are often the most neglected of all health system functions in limited-resource settings. In particular, strong disease surveillance programs can inform the priorities for UHC and track progress. Box 3.2 summarizes some of the major information needs in limited-resource settings, emphasizing disease surveillance.

Although research is often perceived as a global public good rather than a specific national priority for limited-resource settings, a local research agenda could prioritize the validation of interventions and policies that have been tried in other settings but that likely vary significantly in effectiveness and cost-effectiveness because of differences in culture, language, disease epidemiology, and health system arrangements. In the long term, many countries could begin to develop completely novel interventions guided by local experience. Developing local capacity to conduct health technology

Box 3.2

Health System Information and Research Needs in Limited-Resource Settings

Routine, reliable, low-cost, long-term surveillance are vital to maintaining public health and providing effective medical care. Health surveillance systems are also critical to tracking trends in health conditions of the population, detecting new epidemics and outbreaks (such as Ebola and Zika virus infection), evaluating the success of control programs, and improving accountability for health expenditures. Surveillance supports five objectives, although, unfortunately, systems covering all five functions are rare in most LMICs:

- Monitoring of population health status (the most important aspect of which is premature mortality) to guide policy choices
- Efficiency in use of resources
- Disease surveillance to aid control programs
- Epidemic alert to enable rapid response and containment
- Identification of new risk factors or intermediate determinants of disease

Currently, no low-income country has adequate coverage of these key and often quite different surveillance functions. However, effective models have been implemented successfully in some countries, often at low cost. In India, for example, the Registrar General has created the Million Death Study in which a verbal autopsy instrument is added to its Sample Registration System to obtain cause-of-death data, by age, from about 1.4 million nationally representative homes from every state. The overall system costs less than US$1 per person annually. The Million Death Study has transformed disease control in India by enhancing the amount and quality of health data available for public health officials (Jha 2014).

A variety of new approaches could be taken to expand surveillance to support the core goals of UHC and increase the demand for such surveillance. These include increasing global assistance allocations from development agencies, expanding monitoring for NCDs in particular, and promoting international health audit days. More information on these opportunities can be found in annex 3G.

assessment and health policy analysis, while still aspirational for a number of LMICs, will ensure that the UHC agenda is realized in the most effective, efficient, and equitable manner possible.

The Role of Priority-Setting Institutions

This chapter has argued that UHC in some form can be realized in nearly every country and that an array of highly cost-effective, currently available interventions can be efficiently employed in limited resource settings to help countries reach most, if not all, of the SDG 3 goals and targets. By using economic tools and evidence, countries can develop health benefits packages that address their major health concerns on the basis of allocative efficiency, equity, and feasibility. Benefits packages designed in this way provide good value for money. By dramatically improving population health, they could also, over time, foster economic development and support other social goals, including poverty reduction.

At the same time, experience from all parts of the world has shown that setting priorities can also evolve in an inefficient and potentially inequitable manner (Kieslich and others 2016). Political calculus, inertia, efforts of prominent disease advocates, and donor priorities, among other influences, can at times create inefficiencies and increase inequalities if not well managed. In contrast, public sector priorities need to account for the preferences and expectations of the local population, which may deviate from what clinicians or technocrats would predict or extrapolate from other settings (Larson and others 2015). Robust, transparent, and publicly accountable priority-setting institutions are essential in all countries, but most LMICs do not yet have these sorts of institutions. Notable country examples from across the development spectrum can provide a template for building local capacity for health policy analysis and health technology assessment in LMICs (Li and others 2016). Academic organizations and partnerships such as the International Decision Support Initiative also play an important role in building local

capacity to conduct health technology assessment and policy analysis in lower resource settings.[5]

As resources increase within a country, the possibilities for what a UHC scheme could include will grow as well. Glassman and others (2016) have described the process of defining a health benefits package as cyclical, with iterative improvements and revisions over time as well as expansions in the services offered. At the same time, *Making Fair Choices* argued that, when an existing package of interventions is not yet universally available, it is fairer to focus on achieving full coverage of that package before adding interventions to the package (WHO 2014). In practice, this principle can be difficult to follow, and in some cases, novel interventions are arguably worth considering on efficiency grounds if they result in significant economies of scope. Yet within the context of *DCP3*, the ethical principle suggests that, in general, all countries could first strive to achieve full coverage of the HPP (that is, of the most cost-effective interventions in a given setting), begin to add the EUHC interventions incrementally, and then expand to a broader range of interventions similar to those available in upper-middle-income or high-income settings.

For most low-income countries, implementing and scaling up a package like the HPP would likely be the focus during the SDG period. (Low-income countries that wish to offer a broader set of interventions than what is outlined in the HPP could continue to deliver this set of interventions; however, lower-priority interventions would need to be identified from among this set and financed through copayment or cost recovery mechanisms until public budgets were sufficient to cover the entire set [WHO 2014].) For lower-middle-income countries, the initial focus might be reaching full coverage of the HPP (if full coverage has not already been achieved), then moving toward full EUHC. The focus for most upper-middle-income and high-income countries might be ensuring full EUHC, which in some cases may require disinvesting from interventions and technologies that provide less value for money.

These sorts of actions undoubtedly require strong political commitment and mechanisms for managing special interests (Reich and others 2016). Nevertheless, this chapter argues that EUHC is a relevant and useful notion for all countries regardless of income, because it represents the aspects of health care that are likely to provide the best value for money and thus be the most efficient use of the next health care dollar. For LMICs in particular, EUHC could provide an economically grounded and realistic pathway to UHC and facilitate progress toward a "grand convergence" in global health during the SDG period (Jamison and others 2013).

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ANNEXES

The following annexes to this chapter are available at http://www.dcp-3.org/DCP.

- Annex 3A: An Essential Package of Interventions to Address Congenital and Genetic Disorders
- Annex 3B: An Essential Package of Interventions to Address Musculoskeletal Disorders
- Annex 3C: Essential Universal Health Coverage: Interventions and Platforms
- Annex 3D: Notes on the Essential UHC Interventions in Annex 3C
- Annex 3E: Methods for Appraisal of Essential UHC Interventions
- Annex 3F: Findings from the Appraisal of Essential UHC Interventions
- Annex 3G: The Role of Surveillance in Achieving UHC

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. SDG 3, titled "Good Health and Well-Being," provides the following: "Ensure healthy lives and promote well-being for all at all ages" (UN 2016).
2. The "*Making Fair Choices* consultation" refers to the WHO Consultative Group on Equity and Universal Health Coverage, the author of *Making Fair Choices on the Path to Universal Health Coverage* (WHO 2014).
3. Estimates from Vos and others (2016) were used because similar data were not available from WHO.

4. Current GNI data by country aggregated using the 2014 country classification, see http://data.worldbank.org/indicator/NY.GNP.ATLS.CD?page=1.
5. For more information, see the International Decision Support Initiative website, http://www.idsihealth.org/who-we-are/about-us.

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