

## Chapter 15

# Innovations to Expand Access and Improve Quality of Health Services

Lori A. Bollinger and Margaret E. Kruk



## INTRODUCTION

The first two editions of *Disease Control Priorities* contained extensive discussions of which health care services should be delivered to reduce the global burden of disease for a wide variety of diseases. These editions also provided justification, including by calculating cost-effectiveness ratios, for prioritizing the particular interventions (Jamison and others 1993; Jamison and others 2006). There was, however, little discussion of which service delivery platforms could be used to deliver the prioritized health care services.

To facilitate this discussion, we describe the existing health care service delivery mechanisms for reproductive, maternal, newborn, and child health (RMNCH) that are not community based. (The availability of community-based RMNCH service delivery is discussed in chapter 14 of this volume, Lassi, Kumar, and Bhutta 2016). We discuss different ways of organizing service delivery, including innovative approaches and their impacts on the quality of services delivered.

We begin with a landscape analysis of RMNCH indicators, organized by the conceptual framework used throughout this volume and described in detail in chapter 1: structure, including human resources; process; and outcomes. We next discuss different ways of organizing service delivery for RMNCH, including task-shifting, as well as examples unrelated to personnel. We examine coverage gaps and efforts to

boost coverage, and we describe innovations to improve quality. Although evidence exists regarding the benefits of increasing coverage with innovative methods, little support is available on the effects of this increased coverage on quality. This paucity of data is due partly to a lack of an agreed-upon methodological framework, as well as to the poor quality of studies that do attempt to evaluate the innovative interventions.

## LANDSCAPE ANALYSIS OF INDICATORS

To ensure the most consistent and comparable results, we present data from the World Bank World Development Indicators database, retrieving the most recent data for each country and averaging across available countries for each indicator to calculate regional averages for low- and middle-income countries (LMICs) in six regions: East Asia and Pacific, Europe and Central Asia, Latin America and the Caribbean, the Middle East and North Africa, South Asia, and Sub-Saharan Africa.

- First, we discuss indicators that represent the structure of the service delivery platforms, measured by the number of nurses and midwives per 1,000 people, the number of physicians per 1,000 people, and the number of hospital beds per 1,000 people.
- Second, we present indicators measuring the process of health care service delivery. For children, these are the

percentage of children under age five years being taken to health providers for treatment of acute respiratory infection, the percentage under age five years with a fever receiving antimalarial drugs, and the percentage under age five years receiving a packet of oral rehydration solution for the treatment of diarrhea. For women, these indicators are the percentage of births being attended by skilled health staff and the percentage of pregnant women receiving antenatal care.

- Finally, we examine indicators for outcome measures. For children, these are the percentage ages 12–23 months being immunized against diphtheria, pertussis, and tetanus (DPT); the percentage ages 12–23 months being immunized against measles; the percentage of newborns being immunized against tetanus; the percentage under age five years using insecticide-treated bednets; and the percentage ages 6–59 months receiving vitamin A supplementation. For women, this is the percentage of married or in-union women ages 15–49 years having an unmet need for contraception.

### Structure of Service Delivery Platforms

Dramatic differences in absolute numbers of structural resources can be seen across regions. Europe and Central Asia contain the highest average number of resources, while South Asia and Sub-Saharan Africa contain the lowest.

Of the 49 countries that the World Bank has categorized as low income, only five meet the minimum standard established by the World Health Organization (WHO) of 23 nurses, midwives, and physicians per 10,000 population (Global Health Workforce Statistics, <http://www.who.int/hrh/workforce>).

A number of structural resources is associated with each region (table 15.1, panel A).

#### Number of Nurses and Midwives per 1,000 People

Europe and Central Asia has 5.36 nurses and midwives per 1,000 people, almost twice as many as the next three best-served regions: Latin America and the Caribbean (2.76), East Asia and Pacific (2.52), and the Middle East and North Africa (2.40). After these four regions, the number of nurses and midwives per 1,000 people drops dramatically to about 1 in Sub-Saharan Africa; South Asia has only about 0.5 nurses and midwives, less than 10 percent of the value observed in Europe and Central Asia.

#### Number of Physicians per 1,000 People

At 2.78, Europe and Central Asia also has the highest number of physicians per 1,000 people. This is almost twice as high as the values for the next regions; Latin America

and the Caribbean and the Middle East and North Africa each have 1.5 physicians per 1,000 people. East Asia and Pacific drops significantly below that figure, with only 0.9. This value drops again by half in South Asia, which has 0.4. Sub-Saharan Africa has only 0.16 physicians per 1,000 people, which is not quite 5 percent of the value observed in Europe and Central Asia, an even greater differential than that between the highest-covered and lowest-covered regions for nurses and midwives.

#### Number of Hospital Beds per 1,000 People

The number of hospital beds per 1,000 people varies from a high of 5.34 in Europe and Central Asia to a low of 1.41 in Sub-Saharan Africa. Europe and Central Asia has more than double the number of hospital beds as in the next region, 2.56 in East Asia and Pacific. Latin America and the Caribbean and the Middle East and North Africa have similar values, at approximately 1.9 hospital beds; South Asia and Sub-Saharan Africa have the fewest number of hospital beds, at 1.50 and 1.41 per 1,000 people, respectively. This value is approximately 25 percent of Europe and Central Asia, indicating a relatively lower level of inequality in the distribution of resources.

### Process of Health Care Service Delivery

#### Indicators Related to Children

The indicators measuring the health care delivery process, which contribute to the final set of indicators—health outcomes—are displayed in table 15.1, panel B. The values for the two process indicators related to children are much more similar across regions than are the values for the structural indicators. The values for the first indicator, the percentage of children with acute respiratory infection taken to health providers, range from a high of 70 percent in Europe and Central Asia; to East Asia and Pacific and the Middle East and North Africa, with values of 69 percent and 68 percent, respectively; to a low of 50 percent in Sub-Saharan Africa. Latin America and the Caribbean and South Asia fall in between, at 64.5 percent and 56.7 percent, respectively. The lowest value is fully 70 percent of the highest value, which is significantly better than the differential that exists for structural indicators.

The same is true for the second process indicator related to children, the percentage of children under age five years receiving oral rehydration solution for diarrhea. East Asia and Pacific displays the highest percentage at 50.7 percent, followed by South Asia at 47.4 percent, Latin America and the Caribbean at 44.5 percent, the Middle East and North Africa at 38.8 percent, Europe and Central Asia at 38.7 percent, and Sub-Saharan Africa at 34.2 percent. The difference between the highest and

**Table 15.1** Structure, Process, and Outcomes Indicators for RMNCH, by Region

Indicators	Region					
	Europe and Central Asia	East Asia and Pacific	Latin America and the Caribbean	Middle East and North Africa	South Asia	Sub-Saharan Africa
<b>A. Structure (including human resources)</b>						
Nurses and midwives (per 1,000 people)	5.36	2.52	2.76	2.40	0.46	0.99
Physicians (per 1,000 people)	2.78	0.86	1.49	1.47	0.44	0.16
Hospital beds (per 1,000 people)	5.34	2.56	1.95	1.86	1.50	1.41
<b>B. Process</b>						
ARI treatment (percent of children under age five years taken to health providers)	70.3	69.0	64.5	68.0	56.7	50.3
Diarrhea treatment (percent of children under age five years who received ORS packet)	38.7	50.7	44.5	38.8	47.4	34.2
Births attended by skilled health staff (percent of total)	98.0	81.2	86.7	84.8	40.3	57.8
Pregnant women receiving prenatal care at least once (percent)	95.3	91.6	94.4	87.5	59.4	81.9
<b>C. Outcomes</b>						
Immunization, DPT (percent of children ages 12–23 months completing three doses)	91.7	90.1	89.9	89.3	81.2	78.0
Immunization, measles (percent of children ages 12–23 months)	93.2	88.9	91.1	88.9	80.0	76.1
Newborns protected against tetanus (percent)	83.9	82.1	83.2	86.0	79.6	80.7
Unmet need for contraception (percent of married women ages 15–49)	15.2	21.4	16.1	13.8	20.5	25.1
Vitamin A supplementation coverage rate (percent of children ages 6–59 months)	95.0	75.9	31.0	42.2	88.2	70.9

Source: Calculations based on World Bank World Development Indicators database.

Note: ARI = acute respiratory infection; DPT = diphtheria, pertussis, and tetanus; ORS = oral rehydration solution; RMNCH = reproductive, maternal, newborn, and child health.

lowest observations is about the same as for the previous indicator, with the lower statistic approximately 67 percent the level of the higher statistic.

### Indicators Related to Women

The percentage of births attended by skilled health staff reaches 98 percent in Europe and Central Asia. The next three regions follow closely: Latin America and the Caribbean at 86.7 percent, the Middle East and North Africa at 84.8 percent, and East Asia and Pacific at 81.2 percent. The value for the next region, Sub-Saharan Africa, drops to 57.8 percent. The lowest level is in South Asia; skilled health personnel attend only 40.3 percent of births; this rate is only 40 percent of the value in Europe and Central Asia.

The percentage of women receiving some antenatal care (ANC) shows a slightly more compressed

distribution of values across regions. The highest value is observed again in Europe and Central Asia, followed even more closely by Latin America and the Caribbean (94.4 percent), East Asia and Pacific (91.6 percent), and the Middle East and North Africa (87.5 percent); Sub-Saharan Africa is only slightly lower at 81.9 percent. South Asia lags, with only 59.4 percent of women receiving some prenatal care; this lowest value is still about 60 percent of the value observed in Europe and Central Asia.

### Health Outcomes

The indicators representing health outcomes as a result of the performance of the RMNCH health care service delivery system are displayed in table 15.1, panel C.

## Immunizations

The recent push to increase coverage in immunizations is reflected in the relatively high rates shown in table 15.1, with only one region's immunization coverage rate dropping below 80 percent for each of the first three indicators. The first four regions show rates of about 90 percent for fully immunizing children against DPT and measles; South Asia and Sub-Saharan Africa report child immunization rates of about 80 percent. The lowest percentages for these two immunization rates are about 85 percent of the value of the highest percentages, indicating a fairly even distribution of immunization rates across all LMICs. The percentage of newborns protected against tetanus is slightly lower overall; the highest value is 86 percent in the Middle East and North Africa. However, the lowest value is 79.6 percent in South Asia, fully 93 percent of the highest value.

## Unmet Need for Contraception

The unmet need for contraception varies from 25.1 percent in Sub-Saharan Africa to 13.8 percent in the Middle East and North Africa. Both Latin America and the Caribbean and Europe and Central Asia have values similar to those of the Middle East and North Africa, 15.2 percent and 16.1 percent, respectively. South Asia and East Asia and Pacific have similar levels of unmet need at 20.5 percent and 21.4 percent, respectively.

## Vitamin A Supplementation

The percentage of children receiving vitamin A supplementation varies widely from 95 percent in Europe and Central Asia to 31 percent in Latin America and the Caribbean.

# ORGANIZING SERVICE DELIVERY

## Task-Shifting Related to Personnel

Given the significant financial requirements for health systems in LMICs, which are confronted by personnel costs that account for a large proportion of budgets and shortages of health personnel, one innovative approach to delivering more services is by reassigning part or all of certain tasks to lower cadres of workers. Because the quality of services may be affected through task-shifting, the WHO undertook an extensive review of the literature to determine which interventions could be delivered safely and effectively by different cadres, and in a sustainable fashion (WHO 2012).

Based on the evidence, the following classification can be used to determine whether task-shifting is appropriate for specific interventions:

- Recommend
- Recommend with targeted monitoring and evaluation
- Recommend only in the context of rigorous research
- Recommend against the practice.

Based on the literature review referred to above, and documented in the 2012 recommendations, the Guidance Panel made 119 recommendations for tasks that could be potentially shifted: 36 for lay health workers, 23 for auxiliary nurses, 17 for auxiliary nurse midwives, 13 for nurses, 13 for midwives, 8 for associate clinicians, 8 for advanced-level associate clinicians, and 1 for nonspecialist doctors.

In addition, the Guidance Panel refers to several factors that might create difficulties when task-shifting is implemented:

- *Management of programs:* If sufficient and trained management personnel are not available to supervise the lower cadre of workers, quality and efficiency may suffer. However, local implementation of programs might improve with local knowledge.
- *Financial issues:* Financial management capacity may not be available at more decentralized levels, which would impede the success of task-shifting. In addition, if higher cadres are compensated on a fee-for-service basis, shifting tasks may affect their income and hence encounter resistance.
- *Supply issues:* Shifting to more decentralized service delivery may result in stock-outs if logistical systems are overwhelmed.
- *Effects of task-shifting on personnel:* Task-shifting will affect providers from whom and to whom tasks are shifted, along with their interactions. Ensuring their inclusion in the design process could help smooth the transition.
- *Health workforce impacts:* The demand for both pre-service and in-service training is likely to increase. In addition, lower cadres will likely need higher levels of supervision and support, which should be included in any analysis of the financial implications of task-shifting.

## Task-Shifting Related to Other Approaches

Several innovative approaches unrelated to personnel have been reported.

- Two studies evaluate the safety and efficacy of using sublingual misoprostol for incomplete abortions instead of surgical techniques, basically shifting the task from expensive personnel to a medication, although some personnel were involved in the implementation of the interventions (Ngoc and others 2013; Shochet and others 2012).
- An example of innovative task-shifting was reported in Ethiopia in measuring maternal mortality. A community-based approach in a rural area was tested at three health posts and one health center. Instead of tasking physicians with attributing cause of death, this approach trained priests, traditional birth attendants, and community-based reproductive health agents in reporting all births and deaths to the community health post (Prata, Gerdt, and Gessesew 2012).
- A review article of the use of ultrasound to diagnose obstetrical conditions in LMICs finds that it was highly effective, resulting in different clinical management in more than 30 percent of cases. The authors recommend expanding its use for tropical and noncommunicable diseases (Groen and others 2011).

## EXPANDING COVERAGE AND IMPROVING QUALITY OF CARE

Achieving health improvements for women and children requires high coverage of essential interventions. It also requires that those interventions be effective in combating disease and promoting health. The success of the RMNCH agenda hinges on achieving both coverage and quality. In this section, we review selected current approaches to improving the coverage of priority RMNCH health care services, as well as efforts to improve their effectiveness. The list is not comprehensive; rather, it focuses on initiatives that have been (1) implemented in multiple LMIC settings in the past decade and (2) evaluated. We focus on strategies that receive substantial support from global funders, such as the World Bank, the WHO, and private foundations. The selection draws on several recent reviews, including Mangham-Jefferies and others (2014) and Dettrick, Firth, and Jimenez Soto (2013). A forthcoming overview of systematic reviews from the Cochrane Effective Practice and Organisation of Care Group (<http://epoc.cochrane.org/>) will provide more extensive guidance on what works to improve utilization and quality. An extensive review of strategies to improve provider performance is also near completion at the Centers

for Disease Control and Prevention (Rowe and others 2015). Although for child health in particular, many essential interventions are in the home and community, we focus here on improving access to and quality of care in clinical settings—clinics, health centers, or hospitals.

### Expanding Coverage

The Millennium Development Goals proposed ambitious maternal and child health targets: two-thirds reduction in under-five mortality and three-quarters reduction in maternal mortality between 1990 and 2015. These goals were based on expert estimates that if existing health interventions could be distributed to all women and children in need in LMICs, it would be possible to reduce mortality dramatically without the need for further technical breakthroughs. This remarkable assertion shone the light on gaps in coverage of RMNCH services.

Bhutta and others (2010) review the progress on provision of 26 key maternal and child health intervention in 68 countries that accounted for more than 90 percent of maternal and child health deaths globally in 2010. As table 15.1 shows, they find substantial underprovision of a range of health services. Coverage tended to be highest for interventions that can be delivered vertically through specialized programs or campaigns and can be scheduled in advance. In contrast, coverage of curative interventions, and those that were more complex or required treatment on demand, was lower. An excellent example of this divergence is the high coverage of ANC versus the low coverage of deliveries by skilled birth attendants. The coverage gaps for curative and complex interventions result from weak health systems in which health workers are few and often unmotivated; facilities are deteriorating; and supplies, equipment, and medicines are lacking. Perhaps most important, accountability for results is weak: only one in three of the countries reviewed had policies for maternal death notification, and fewer than one in two had robust vital registration systems (Bhutta and others 2010). Accountability is even weaker at the facility level, where poor outcomes rarely lead to needed changes (Pattinson and others 2009).

Equity analyses show major variations in coverage levels within low-income, high-burden countries, with the rich utilizing maternal and child health services more than the poor. The differences are largest for health system interventions, such as skilled birth attendance, and for ANC visits, where the ratio of coverage between the richest and poorest wealth quintile ranges from 3:1 to 5:1 (Barros and others 2012).

Efforts to increase coverage of RMNCH services have largely centered on users. These demand-side interventions are intended to raise awareness of the need for health care and reduce the direct and opportunity costs of care seeking.

### **Community Mobilization and Community Health Workers**

The formation of women's groups to promote effective parenting, feeding, and recognition of signs of illness has been tested in several settings. Fottrell and others (2013) find that introduction of women's groups that participated in a learning and action cycle to improve the health of mothers and children in a cluster randomized trial in Bangladesh was associated with a 38 percent reduction in neonatal mortality and was cost-effective. A study in Malawi reports reductions in both maternal mortality and infant mortality in areas with women's groups, compared with groups with peer counselors (Lewycka and others 2013). A meta-analysis including these and other rigorous studies suggests that women's participatory learning and action groups could potentially reduce maternal mortality by 37 percent and newborn mortality by 23 percent (Prost and others 2013).

Community health workers, most of whom are community members with modest health training, have been effective in increasing the uptake of some interventions, including immunization, as well as in promoting breastfeeding. There is less evidence on their ability to increase care seeking for childhood illness or improve effectiveness of tuberculosis treatment (Lewin and others 2010).

### **User Fee Removal**

User fees, or payments for services at the point of care, have been extensively studied for their role in suppressing health care seeking. In the wake of the Millennium Development Goals, many LMICs in Sub-Saharan Africa removed user fees for maternal and newborn care in the mid-2000s to enhance ANC and skilled delivery coverage. User fee removals have typically resulted in increased utilization of the targeted service, sometimes by a large margin (Lagarde and Palmer 2008; Ponsar and others 2011). The effect is particularly pronounced for curative services, with the poor showing the largest increases in utilization (Nabyonga and others 2005). However, effects on quality of care and long-term health outcomes have not been systematically examined. Adequate preparation for user fee removal is required if facilities are not to be overwhelmed with new patients (Meessen and others 2011). At the national level, greater reliance on government health financing (versus out-of-pocket and private insurance) is associated with

higher coverage of skilled delivery attendants and cesarean sections (Kruk, Galea, and others 2007).

It is increasingly evident that user fee removal, while promoting utilization, does not protect women and families from financial hardship (Kruk and others 2008; Xu and others 2006). This is particularly the case with complex services, such as emergency obstetric care, and for poor families. This hardship is driven by costs of travel, purchase of supplies and medicines out of stock in government clinics, informal payments, and the continued use of private providers where available (Nabyonga and others 2011). In short, removal of user fees is an important but partial solution to expanding coverage and providing financial protection.

### **Conditional Cash Transfers**

Conditional cash transfers (CCTs) are negative user fees in the sense that they pay households for using services rather than charging them for services. Whereas LMICs have experimented with removing fees, many countries in Latin America and the Caribbean have introduced financial incentives for using care, with the aim of improving home health practices and health care utilization, as well as a wide range of other desired social behaviors, such as education and employment. A 2007 Cochrane review finds that conditional transfers were associated with higher utilization and may be an effective approach to promoting preventive interventions, such as immunization (Lagarde, Haines, and Palmer 2007).

Recent experiences with CCTs have been positive. Brazil's Bolsa Familia program, which provided households with cash transfers of US\$18 to US\$175 per month conditional on fulfilling the requirements on health and education, were associated with reduced under-five mortality. Effects increased with Bolsa Familia coverage and were greatest for mortality due to malnutrition (Rasella and others 2013). The Mexican program Oportunidades, which paid women for ANC visits, increased ANC attendance but also increased delivery by physicians or nurses by 40 percent to 90 percent in rural Mexico (Sosa-Rubi and others 2011). The same program raised cesarean section rates among underserved poor women in rural areas by 7.5 percent (Barber 2010).

A current debate is whether unconditional cash transfers (UCTs)—cash transfers to the poor not linked to specific desired behaviors—can accomplish similar outcomes while reducing administrative and logistical hurdles. A study in Zimbabwe shows that CCTs and UCTs achieved similar improvements in school attendance, and that CCTs but not UCTs increased the proportion of children with birth certificates (Robertson and others 2013). Another study finds that UCTs and CCTs reduced human immunodeficiency virus (HIV) and herpes simplex

virus 2 infections in adolescent girls (Baird and others 2012). In addition to the debate about the effectiveness of UCTs and CCTs, very little evidence is available on the cost-effectiveness of these strategies (chapter 17 in this volume, Horton and Levin 2016). More research is needed to achieve efficient and effective policies.

### **Vouchers**

Vouchers are another type of demand-side incentive. Vouchers are distributed or sold at a discount to target populations who can exchange them for health services by contracted providers or facilities. Vouchers often include private sector services, thereby enlarging the set of health service options for women and children. Because provider participation in voucher schemes is generally conditional on accreditation, voucher programs offer an opportunity to improve the quality of care in enrolled facilities. Vouchers have been extensively used to promote the uptake of family planning, facility birth delivery, and child preventive care. Although rigorous evaluations are few, vouchers have been linked to increases in utilization of facility delivery and family planning services (Bellows and others 2013; Bellows, Bellows, and Warren 2011). Vouchers appear to be less effective in areas with high levels of poverty, where contracted facilities are fewer, and where roads are poor (Kanya and others 2013). Transport vouchers are a promising intervention in these areas (Ekirapa-Kiracho and others 2011).

However, a quasi-random evaluation of a very large voucher-type scheme, India's Chiranjeevi Yojana, finds no differences in facility delivery rates or newborn complications, compared with nonprogram areas. This study is notable for contradicting earlier findings of large improvements in facility deliveries and reductions in maternal and child deaths, which the authors of the evaluation attribute to poor study design in earlier research. The Chiranjeevi Yojana program, which covered 800,000 deliveries between 2005 and 2012, paid contracted private sector hospitals a fixed fee (US\$37) per vaginal or cesarean delivery per poor woman. The authors note that poor quality in contracted hospitals and high transport costs may have constrained demand for services (Mohanan and others 2013).

### **Performance-Based Financing**

Performance-based financing (PBF), or paying for performance, is a supply-side financing method that rewards providers or health care organizations for achieving coverage or quality targets. These rewards typically are in the form of bonus payments in addition to regular salaries. A frequently cited study from Rwanda shows a 23 percent increase in facility delivery and larger increases in preventive care visits by young children in facilities enrolled

in pay-for-performance schemes, as compared with randomly selected controls (Basinga and others 2011). These increases did not favor the rich or the poor, so additional measures would be required to close the equity gap in utilization (Priedeman Skiles and others 2012).

However, a Cochrane review suggests that the quality of evidence is too poor to draw general conclusions about the effectiveness of PBF, noting that several studies arrived at contradictory results (Witter and others 2012). Fretheim and others (2012) argue that PBF is a donor fad and unproven; others counter that whatever its direct effects, PBF may trigger constructive reforms in public health systems to make care at public facilities more efficient and responsive (Meessen, Soucat, and Sekabaraga 2011).

### **Improving Quality**

Poor quality of care is a double obstacle to improved survival for mothers and children; it deters utilization and hinders achievement of good health outcomes. To improve health, health care has to be effective and safe. Good-quality care is also respectful and considers the needs and preferences of patients. Interventions that are efficacious in clinical trials or in highly skilled settings in high-income countries have frequently been shown to be less effective when implemented in resource-constrained health systems in LMICs (Das and Gertler 2007; Das and others 2012; Leonard and Masatu 2007).

Quality of care for complex services is particularly problematic. Souza and others (2013) assess the use of evidence-based interventions in maternal health care and the frequency of poor maternal outcomes (near miss or maternal death) in large hospitals in 29 LMICs. The investigators find that mortality ratios were two to three times higher than expected on the basis of illness severity in high and very high maternal mortality ratio countries, which were the poorest countries in the sample; most were in Sub-Saharan Africa. These excess deaths occurred despite the high use of key interventions, such as magnesium sulfate for treating preeclampsia and eclampsia. Delays in the detection or treatment of complications, poor-quality critical supportive care (such as airway and fluid management), and weak infection control explained the poor outcomes (Souza and others 2013).

In addition to affecting health outcomes, quality of care can influence coverage. Good quality promotes trust in the health system and encourages utilization; poor quality can dissuade people from using health care.

One indicator of population preferences for care is bypassing—going to a more-distant facility when a nearby health facility is available. Bypassing is

considered a strong sign of revealed preference, given that attending distant facilities takes longer and is more costly. Leonard, Mliga, and Mariam (2002) show that Tanzanian patients travel farther if they can access providers with greater medical knowledge and facilities that are better stocked. In examining the utilization of facilities for delivery, our research finds that 4 in 10 women bypassed local facilities to deliver in hospitals in western Tanzania, despite wide availability of nearby dispensaries that could provide the service (Kruk, Mbaruku, and others 2009). Bypassing was highest among first-time mothers, who were likely motivated by perceived higher risk of first delivery; it was also higher among women who perceived the local clinic to provide low-quality care.

In a separate paper, Kruk, Paczkowski, and others (2009) find strong preference for quality-of-care attributes in shaping women's decisions on where to seek care. We conclude that these data are consistent with high home delivery rates, given that few facilities can provide the quality that women expect. A range of qualitative studies supports the notion that women avoid low-quality facilities and may forgo care altogether if better options are not accessible (Abelson, Miller, and Giacomini 2009; Gilson 2003; Russell 2005).

Quality improvement in RMNCH is a vast enterprise with a long history. The initiatives here are not a comprehensive list; we focus on the strategies that have been recently applied in LMICs at scale, that have received donor support, and that have been evaluated.

### **Measurement and Accreditation**

Accreditation of health facilities, common in high-income countries, is increasingly used as a quality-of-care intervention in LMICs. Accreditation is a formal process of assessing whether a health facility meets agreed-upon quality standards; it is typically conducted by an independent body. Published data suggest that accreditation is more common in middle-income countries than in low-income countries. Quimbo and others (2008) find that clinical performance in pediatric care was better in providers who worked in accredited hospitals in the Philippines. An even more influential factor was receipt of insurance payments, which were disbursed, at least in part, on the basis of compliance with clinical practice guidelines—and so could be seen as a payment for performance.

In Sub-Saharan Africa, accreditation is still rare, and evidence of its effects is rarer still. The Zambian Ministry of Health implemented a comprehensive accreditation program for its hospitals with support from the United States Agency for International Development (USAID). The program succeeded in

raising compliance with standards, but the complex logistics and high costs (US\$10,000 per hospital) of the accreditation process resulted in its cancellation (Bukonda and others 2002). Liberia, which is rebuilding its health system after 14 years of civil war, introduced more streamlined tablet-based data collection for accreditation in all 437 facilities in the country as a requirement for receiving funding. Facilities were rated using a star system. Although the baseline data were successfully collected, the follow-up assessment to demonstrate quality improvements has not been completed. However, the initial data showing large deficiencies in laboratory functions spurred national purchase of laboratory equipment (Cleveland and others 2011).

### **Performance-Based Financing**

One of the potential reasons for poor-quality care may be a mismatch between provider knowledge and the effort providers make when treating patients. This might occur if providers are unmotivated or underpaid. PBF has been applied to improving the quality as well as the quantity of services.

A randomized trial in the Philippines tested the effect of a 5 percent salary bonus paid to physicians upon improvement on clinical vignettes—tests of clinical competence (Peabody and others 2014). The study finds improvements in self-reported health and wasting in children under age five years who attended intervention facilities. The authors note that the measurement and feedback to providers about their performance on the clinical vignettes was an essential element of the intervention.

Rusa and others (2009) find that PBF payments representing 40 percent to 80 percent of nurses' salaries that were paid in part on improved quality metrics were temporally associated with improved quality of maternal and child health services in health centers in Rwanda. The metrics included completed partograms, growth curves, follow-up for missed visits, and mother and child alive on discharge. Overall, the centers involved in PBF reached quality metrics between 80 percent and 95 percent of total possible scores within 18 months. However, the study design makes it impossible to disentangle the effects of PBF from overall salary increases, monthly supervision visits introduced as part of PBF, and other health system reforms at the same time in the country.

A lively discussion about the role of PBF in global health has ensued on the basis of these and other experiences. Some argue that PBF can catalyze essential health system reforms (Meessen, Soucat, and Sekabaraga 2011). Others believe that it is at best a



partial solution and may create important distractions from more fundamental health system reform, such as expanding the health workforce and raising the salary floor (Ireland, Paul, and Dujardin 2011). Most agree that the jury is still out about the extent to which paying for performance—apart from raising salaries and increasing oversight—is transformative in improving quality (Basinga, Mayaka, and Condo 2011). The lack of evidence has not stopped adoption: 22 countries in Sub-Saharan Africa have introduced PBF in the past several years (Soeters and Vroeg 2011; Spector and others 2012).

### **Training and Supportive Supervision**

Supportive supervision is managerial support for front-line health workers, typically through periodic visits from first-level hospitals to peripheral facilities. It is intended to support quality of care and improve provider motivation and retention through nonpunitive review of practices and mentoring. It is popular in many countries where health services are decentralized and where structures to perform supportive supervision exist, at least in theory (Rowe and others 2005).

A Cochrane review of the evidence on supportive supervision in general primary care, not solely maternal and child health, is conducted by Bosch-Capblanch, Liaqat, and Garner (2011). They assess nine studies and find generally small benefits for provider practice and knowledge. They note that the quality of the assessments was weak.

A few country studies since 2011 show more positive results. Hoque and others (2013) find that monthly supportive supervision, combined with Integrated Management of Childhood Illness training, allowed health workers with 18 months of training to provide similar care to providers with four years of training in Tanzania. McAuliffe and others (2013) report that formal systems of supportive supervision were associated with high levels of job satisfaction and low intention to leave among clinical officers in Malawi, Mozambique, and Tanzania.

### **Continuous Quality Improvement and Quality Collaboratives**

Continuous quality improvement (CQI) strategies rely on engaging facility and health system leaders in reflection on and measurement of performance in health care settings. This process involves identifying poor outcomes (for example, postpartum infections) and brainstorming about root and proximal causes. The quality improvement team then identifies causes that are both important and amenable to change and proposes strategies for addressing the cause. CQI

initiatives have shown good results in selected hospitals in the United States, but they have not been widely used in LMICs. One study from Colombia finds that CQI methods used in two nonprofit hospitals in Bogota led to reduction in surgical site infections immediately after the improvements (Weinberg and others 2001).

A related initiative is known as quality collaboratives. First advanced by the Institute for Healthcare Improvement, these consist of multiple facility-based teams working in parallel to apply improvement in a single area of care then sharing results and best practices in learning sessions (Øvretveit and others 2002). Although these initiatives have mostly been implemented in the United States, the USAID has funded quality collaboratives in 14 LMICs. A 2011 review of 27 collaboratives in 12 countries finds generally positive results with 87.4 percent of time-series charts reaching at least 80 percent performance levels on practices such as oxytocin administration within one minute of delivery and retaining HIV-infected patients in care, with gains sustained on average for 13 consecutive months (Franco and Marquez 2011). These data are encouraging but require a substantial health system effort to succeed (Wilson, Berwick, and Cleary 2003). The potential for scale up and the long-term sustainability of these results in the context of weak systems require further study.

### **Use of Checklists**

Surgical safety checklists have been promoted as a means of reducing human errors in health care by ensuring a systematic approach to each patient and procedure. Similar checklists have been introduced for intrapartum care. A pilot study of a 29-point checklist consisting of items such as hand hygiene, administration of uterotonics, and management of complications was piloted at a large hospital in Karnataka, India. The researchers find that the proportion of indicated practices increased from 10 of 29 to an average of 25 (Spector and others 2012). This approach has to be tested to ensure the result can be obtained with a proper counterfactual and, if so, if it can be sustained.

## **COST-EFFECTIVENESS OF INTERVENTIONS TO EXPAND COVERAGE AND IMPROVE QUALITY OF CARE**

Although limited in number, economic evaluations demonstrate that health center and community-based approaches to improving access to care and quality of services are cost-effective as measured by

**Table 15.2** Cost-Effectiveness of Interventions to Improve Quality of Care  
(Compared with no intervention)

Source	Country	Unit	Cost-effectiveness as presented (\$/DALY averted)	Currency (year)	Cost-effectiveness (2012 U.S. dollars)
Bishai and others (2015)	Myanmar	Adding ORS-Z to an additional product line in existing social franchise program (platform)	339.00	US\$ (2010)	3.42
Broughton and others (2011)	Nicaragua	Quality improvement intervention (improved compliance with clinical standards)	Cost saving	US\$ (2010)	0.50
Broughton and others (2013)	Niger	Increasing compliance with high-impact, evidence-based care standards in maternal health care facilities	147.00	US\$ (2008)	150.48
Colbourn and others (2015)	Malawi	Community intervention: Participatory women's groups mobilizing communities around maternal and neonatal health using volunteer facilitators supported by program staff for monthly meetings	79.00	\$Int (2013)	1.30
Colbourn and others (2015)	Malawi	Facility intervention: Quality improvement to train staff, change packages, death reviews, leadership training, protocol-based trainings	281.00	\$Int (2013)	4.63
Colbourn and others (2015)	Malawi	Both community and facility-based interventions	146.00	\$Int (2013)	2.40
Grimes and others (2014)	Malawi	To relieve physician workload, trained orthopedic clinical officers for six months to treat patients needing a manipulation or operation	138.75	US\$ (2012)	168.26

Note: DALY = disability-adjusted life year; \$Int = International dollar; ORS-Z = oral rehydration solution plus zinc.

cost per disability-adjusted life year (DALY) averted (table 15.2). In Nicaragua, learning approaches used through quality improvement collaboration in a hospital setting reduced the length of stay for children with pneumonia and diarrhea and was also cost saving. In Niger, a similar quality improvement collaborative for obstetric and newborn care was both less costly and cost-effective. In Malawi, a community approach using both women's groups and health facility quality improvement that reduced maternal and neonatal deaths was cost-effective. Task-shifting through use of community health workers and lower-level health care providers can be both cost saving and cost-effective (Babigumira and others 2009; Grimes and others 2014; Kruk, Pereira, and others 2007). It is challenging to measure costs and cost-effectiveness associated with programs and policies designed to increase uptake, access, and quality. Part of the challenge lies in the absence of standard metrics for measuring quality; moreover, the health impacts of policies and programs established and implemented at multiple levels of health systems are harder to evaluate.

## CONCLUSIONS

Good maternal and child health care is critical to improving survival and quality of life. Both expansion of access and improvements to quality are crucial elements of good care. Despite growing awareness of serious quality deficits, research on interventions to improve quality has not produced clear guidance on what works and which models improve quality at scale. This void in guidance is due in part to the lack of coherent conceptual frameworks that would direct the testing of promising quality interventions in different settings. Where interventions are tried, the evaluation is often of poor quality.

The situation is better for interventions aimed at increasing coverage of services where good evidence exists for demand-side interventions to motivate service uptake. Particularly effective interventions to expand access include task-shifting, community groups, and CCTs. However, as the epidemiology of maternal and child death shifts to more complex causes, insufficient quality of care will be an increasing barrier to reducing mortality and morbidity and to achieving global health goals. Indeed, expanding coverage will yield diminishing returns unless quality deficits are also tackled.

## NOTE

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–US\$4,125
  - b) upper-middle-income (UMICs) = US\$4,126–US\$12,745
- High-income countries (HICs) = US\$12,746 or more.

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