1. INVESTING STRATEGICALLY IN THE GLOBAL HEALTH WORKFORCE

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The Global Summit, *Strengthening 21st Century Global Health Systems: Investing Strategically in the Health Care Workforce* in October 2011, brought together more than ninety leaders from multilateral organizations, governments, academia, and foundations. The Summit, convened by New York University, College of Nursing, aimed to educate and catalyze funders, especially foundations, on the need for resources to strengthen the health care workforce. In the course of our review of health systems strengthening and health workforce initiatives, we observed that there is a dearth of information on funding human resources for health (HRH), especially from private donors. The gaps in the literature include a compendium of what has been funded; the number of resources that has been invested at local, national, and global levels and by cadre; the outcomes of funding; and finally, the specific areas that need support to grow and develop the global health workforce. The goal of this paper is to help fill those gaps to inform funders and organizations interested in investing in human resources for health. We suggest that increased, strategically directed resources, especially from private funders, are the necessary investments needed to accelerate achievement of health targets.

Private funders can further the agenda to improve population health by strategically partnering with governments in low- and middle-income countries to complement their investments in HRH. The specific aims of this paper are to (1) examine the key issues challenging global health workforce development, recruitment, deployment, and retention; (2) review the progress and effectiveness of interventions related to strengthening the global health workforce; (3) identify funding gaps, strategies, and opportunities to inform funders; and (4) stimulate funders and catalyze productive cross-sector collaborations that will contribute to the production and retention of skilled health care providers working for efficient health systems.

> *A robust health workforce is a core element of health systems in all countries, and critical to achieving the Millennium Development Goals and Universal Health Coverage.* (—GHWA 2011a, 1)

IMPORTANCE OF THE HEALTH CARE WORKFORCE

Population health depends on the availability of a competent health workforce. Yet globally, estimates report from 1 billion to 3 billion people are without access to health services due to shortages of health workers (WHO 2011c, 3; ILO 2010, 1). In 2000, world leaders at the United Nations General Assembly agreed to targets to improve health, reduce poverty, and improve education and sanitation by 2015 (UN 2000). These targets, the Millennium Development Goals (MDGs), have attracted worldwide attention to improve the stark extremes that exist in health and access to health care, especially among individuals living in low- and middle-income countries

(LMICs) and rural areas. The health-related MDGs aim to reduce child mortality (MDG 4); improve maternal health (MDG 5); reduce the rates of HIV/AIDS, malaria, and other diseases (MDG 6); and promote gender equality and empower women (MDG 3).

The 2006 World Health Report detailed the perilous state of health care delivery in LMICs, particularly among those located in sub-Saharan Africa (WHO 2006b). Thirty-six of the fifty-seven "crisis" countries that fall below the minimum target of 2.3 health workers (nurses, midwives, doctors) per 1,000 population are on the African continent (WHO 2012c). This minimum ratio assumes that 2.3 health workers can provide the population with basic health services, such as child immunizations and maternal and infant care, including attended births (ibid.). Extremes in the number of health workers per population are sobering: over half of the crisis countries report ratios of less than 1 health worker per 1,000 population (WHO 2011a, 2012a).

During the past decade, bilateral and multilateral organizations, together with civil society, mobilized resources to work toward the MDG targets. These investments reduced child mortality, expanded access to HIV care, and reduced rates of tuberculosis in some areas (UN 2011; WHO 2012b). Still, the lack of health workers has been widely recognized as a significant barrier to achieving the MDGs or meeting basic health needs. Fifty-three countries continue to have severe shortages of health workers and most of the fifty-seven crisis countries are not expected to reach the MDG health targets (GHWA 2012a; WHO 2012a). Of seventy-four countries reporting data, only twenty-three are on track to achieve MDG 4, and just nine to reach MDG 5 (WHO 2012a). With 2015 approaching, there remains a long way to go. Each day 1,000 women die in childbirth and 19,000 children die from preventable causes (UN-IGME 2012); each year more than 36 million people die from noncommunicable diseases (NCDs) (WHO 2010a, 2010e, 2012a). Groups are convening to develop new targets and metrics for the post-2015 era, and universal health coverage is moving into center stage. Achieving new targets and health system reforms that improve access to and use of health services will depend on the fundamental strength of the health workforce in LMICs' health systems. Public and private resources strategically focused on health systems strengthening and HRH are essential to save lives, prevent disease, and improve health across the globe. These investments must be ramped up and sustained (Middleberg 2010; MSH 2010; Scheffler et al. 2009).

CONTEXT AND CHALLENGES

Sustained improvements in health depend on commitments by donors, both public and private, to grow, educate, and retain a competent health workforce.

Building a competent workforce is complex; it requires long-term commitments from national governments and their partners. To engage funders, they must appreciate the complexities of a

well-performing health system and not view a health system as a misconceived "black hole, black box or laundry list" (Frenk 2010). Compounding the workforce challenge is that the most extreme shortages of health workers exist in countries with the largest burdens of disease and most limited resources. Key observations illuminate the complex factors that affect health systems and the production of a health care workforce (box 1):

BOX 1. HEALTH SYSTEMS FRAMEWORK AND HUMAN RESOURCES FOR HEALTH

1. Both supply of and demand for health professionals in low-income countries are driven by internal and external economic, demographic, and environmental conditions. The supply of health care workers—especially nurses, midwives, and physicians—is often undermined by local practice conditions that "push" migration of professionals from their home countries to other health systems and active recruitment that "pulls" them to high-income countries (Mullan 2002).
2. Across the globe, nurses and midwives and those they supervise provide more than 85 percent of patient care and constitute 80 percent of the health workforce (WHO 2006b). Relative shortages of nurses exist in nearly every country, including high-income settings that have high ratios of nurses per population.
3. Locally and globally, health care workers are inefficiently and inequitably distributed. On national and regional levels, health care workers typically migrate to practice in urban settings, leaving rural areas minimally staffed. This is not just a low-income country phenomenon; it is also typical in high-income settings that have high health worker–to–population ratios.
4. There is a proven relationship between health workforce staffing levels and health outcomes in both low- (Anand and Bärnighausen 2004, 2007; Speybroeck et al. 2006) and high-income settings (Aiken et al. 2002; Altman, Clancy, and Blendon 2004; Estabrooks et al. 2005; IOM 2004; JCAHO 2002; Needleman et al. 2002; Needleman and Buerhaus 2003; Needleman et al. 2006; Rothberg et al. 2005; Tourangeau and Cranley 2006). Multiple Millennium Development Goals and other health priority targets can be achieved by tackling health workforce issues.
5. Despite the need for health workers in low- and many middle-income countries, public sector appropriations for health typically are insufficient to employ the required number of health workers across cadres, let alone employ the many unemployed (APHA 2005; Bossert and Ono 2010; Odaga and Lochoro 2006). In a number of countries, inefficient investment decisions compound worker shortages by supporting an expensive skill mix of specialists and providers in affluent areas.

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Box 1, continued

6. Professional health workers, such as physicians, nurses, midwives, and associate clinicians,[1] take a long time to educate and train, including secondary school preparation. To ensure an adequate supply of competent health workers, a sound approach to HRH management calls for strategic, long-term, national planning and consistent, sustained implementation.
7. The world population is growing; now at more than 7 billion people, it nearly doubled over the last fifty years. Advances made in the recent half century treating and preventing infectious diseases, improving maternal-infant care, and other interventions are increasing life expectancies in low- and high-income countries alike.
8. Increased demand for health care services and prevention strategies, along with perennial concerns over health care costs, are driving the demand for associate clinicians and nonprofessional, community, and lay health workers. Attention to skill mix through task sharing or task shifting can allow more efficient use of human resources, especially in resource-constrained settings (Fulton et al. 2011; Mullan and Frehywot 2007; WHO 2008a, 2012b). Community health workers particularly require ongoing support and supervision and integration into health systems. Evidence indicates the need to address community health worker education, retention, and remuneration (Fulton et al. 2011; GHWA 2010d; Hermann et al. 2009; Lewin et al. 2010; Silbey and Sipe 2004).
9. Health technology production has proven to be a productive and satisfying area for donor investment. Yet, successful delivery of vaccines, diagnostics, or other biomedical and technological interventions requires, at some point in their application, one or more health workers to administer or utilize them.
10. Health workers contribute skills and leadership to the health systems in which they work and to the communities in which they live. Employment in the health sector can help reduce poverty. As women fill the majority of health care jobs globally, addressing gender bias and investing in education of women and girls concretely empower women.

Leadership in Human Resources for Health

Governments, entrusted with the public's interest, are charged with ensuring conditions that promote health. Multiple World Health Organization reports (WHO 2000, 2006b, 2007, 2008b, 2010d), the MDG targets, and the Kampala Declaration and Agenda for Global Action recognize the

importance of strong health systems and call on governments to provide leadership and resources to build their health care workforce (GHWA 2008b). Ownership by national governments is essential; the pivotal role of governments to commit resources and support policies and programs for health was reasserted at Abuja in 2000 and documented in the Abuja Declaration (WHO 2003). Ongoing consensus underscores the essential leadership role that national governments have to allocate resources for health and to strengthen their health systems (Frenk 2010; OECD, WP-EFF, and TT HATS 2011).

Several organizations have designated roles related to the global health workforce. At the WHO, health systems and workforce issues are organized under the Department of Health Systems Policies and Workforce (WHO 2013b). The Global Health Workforce Alliance (GHWA, the Alliance) is responsible for advocacy, convening stakeholders, and knowledge brokering around human resources for health. GHWA, established in 2006 by the World Health Assembly with a ten-year mandate, is a partnership of national governments, civil society, international agencies, financial institutions, researchers, educators, and professional associations dedicated to identifying, implementing, and advocating for solutions (WHO 2006a). The Health Workforce Advocacy Initiative, established in 2007, is the civil society advocacy arm of the Alliance. The Global Code of Practice in International Recruitment of Health Personnel, adopted in 2010 by the World Health Assembly, presents an opportunity to catalyze investments in workforce planning, training, deployment, retention, leadership, and research for health systems improvement (WHO 2010c). Emphasizing results and partnerships and synergy among its stakeholders, GHWA recently expanded its inaugural mission to include a post-2015 agenda: "to advocate and catalyze country and global actions to address human resources for health challenges contributing towards and beyond the health-related Millennium Development Goals and universal health coverage" (GHWA 2012d). The Alliance's vision for success by 2016 includes (1) that funding commitments by governments and donors are sufficient to train and deploy an additional 2.6 million to 3.5 million health workers, (2) that 75 percent of the priority countries implement quality HRH plans, and (3) that HRH is embedded in the post-2015 framework (ibid.).

Partners in health care delivery. While governments have primary responsibility for health, nongovernmental organizations (NGOs), including faith-based organizations, maintain a long and important role in advancing health. In recent years, the number of health-related NGOs that work in low-income countries rapidly increased. These include "faith-based organizations, foreign universities that register as NGOs in local settings, for-profit public health agencies, and donors that act as service providers" (Pfeiffer et al. 2008, 2135). Observers call for NGOs to (1) increase collaboration with other organizations and local sectors; (2) integrate programs and investments in the local ministry of health; (3) improve coordination and synergy across like-minded programs; and (4) abide by ethical practices set through a code of conduct for NGOs (ibid.).

In 2011, a number of advocacy groups concerned over the shortage of health workers formed the coalition Health Workers Count (Save the Children 2011a). Their campaign calls for 2.5 million more doctors, nurses, and midwives and 1 million more community health workers across the sixty highest-need countries. The coalition includes more than 300 member organizations (ibid.).

Examples of other recent advocacy efforts include formation of the Frontline Health Workers Coalition, which includes twenty-seven cross-sectoral member organizations (FHWC 2012a, 2012b), and health worker campaigns such as Every Beat Matters, led by Save the Children, and Hands Up for Health Workers, a Merlin initiative (Merlin 2013; Save the Children 2011b). Organizations such as IntraHealth, which heads up the Capacity Plus project that is funded by USAID, and Management Sciences for Health provide leadership, advocacy, and technical expertise in HRH.

Milestones in Research and Policy

Key milestones, generated through the support of multi- and bilateral organizations and foundations, highlight the progress made during recent years (box 2). For the most part, these activities followed setting MDG targets. As there is no single database on health systems strengthening and HRH initiatives and policies, this list is not all-inclusive.

BOX 2. MILESTONES IN HEALTH WORKFORCE RESEARCH AND POLICY

2004

The Joint Learning Initiative's *Human Resources for Health: Overcoming the Crisis*, supported by the Rockefeller Foundation, which compiled important evidence on HRH, is published. It notes that "Human survival gains are being lost because of feeble national health systems," and that "overburdened and overstressed health workers—too few in number, without the support they so badly need [are] losing the fight" (JLI 2004).

Physicians for Human Rights report, *Action Plan to Prevent Brain Drain: Building Equitable Health Systems in Africa*, is issued at World AIDS conference, Thailand.

UK's National Health System adopts *Code of Practice for International Recruitment of Healthcare Professionals* that replaces a weaker 2001 version and is viewed to be more effective (Buchan et al. 2009; UK DOH 2004).

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Box 2, continued

2005

African Platform for HRH is established to provide network for strengthening HRH in Africa (GHWA 2010c).

Asian-Pacific Action Alliance on Human Resources for Health is established to provide network for regional collaboration around HRH (AAAH 2013).

2006

The World Health Report *Working Together for Health* (WHO 2006b) is published.

American Public Health Association members adopt the resolution *Ethical Restrictions on International Recruitment of Health Professionals to the United States* (APHA 2006). This resolution, which relies heavily on the JLI report around health worker migration, creates bedrock for subsequent research and policy work.

Fifty-ninth World Health Assembly announces Resolution WHA59: 23, *Rapid Scaling-up of Health Workforce Production* (WHO 2006a).

Global Health Workforce Alliance (GHWA) is established, May 2006.

2007

Global Health Workforce Alliance establishes the Health Workforce Advocacy Initiative.

2008

Global Health Workforce Alliance convenes the First Global Forum on Human Resources for Health in Kampala; delegates adopt a twelve-point plan (GHWA 2008b).

The Global Fund joins the GAVI Alliance, the World Bank, and the World Health Organization to create a new health systems funding platform to make better use of new and existing funds for health systems strengthening, including a focus on the health workforce (The Global Fund 2011).

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Box 2, continued

World Health Organization report, *Task Shifting Guidelines*, describes best practices for short-term management of essential HIV/AIDS-related tasks by less intensively trained cadres (WHO 2008a).

Global Health Workforce Alliance releases report with guidance on health worker education and training, *Scaling Up, Saving Lives* (GHWA 2008a).

G8 Summit leaders in Toyako commit to strengthening the health workforce (G8 2008).

US government reauthorizes President's Emergency Plan for AIDS Relief (PEPFAR) commitment from 2009 through 2013 and includes a new commitment to train 140,000 new health workers.

2009

Institute of Medicine issues report, *The U.S. Commitment to Global Health: Recommendations for the Public and Private Sectors*, with guidance on health workforce issues (IOM 2009).

Obama administration (US) sets forth the Global Health Initiative in May 2009, which recognizes the need for resources to strengthen global health systems and grow the workforce (US GHI 2012).

2010

World Health Assembly adopts the Global Code of Practice on the International Recruitment of Health Personnel, which creates an international system for managing problems associated with health worker migration from low- to high-income countries (WHO 2010c).

The Rockefeller Foundation study, *Strong Ministries for Strong Health Systems*, reiterates the importance of government stewardship and governance and identifies seven action areas aimed to support the effective Health Ministries (Omaswa and Boufford 2010).

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Box 2, continued

Sub-Saharan African Medical School study draws attention to ubiquitous faculty shortages in basic and clinical sciences and weak physical infrastructures; it calls for external accreditation and recommends strategies to strengthen medical education in sub-Saharan Africa (Mullan et al. 2011).

Global Health Workforce Alliance issues *Human Resources for Health—Country Coordination and Facilitation (CCF): Principles and Process*. Recognizing the multiple actors involved in HRH, the report establishes a single plan for coordination of policies and programs and outlines responsibilities and actions needed from national governments (GHWA 2010b).

WHO issues *Increasing Access to Health Workers in Remote and Rural Areas through Retention: Global Policy Recommendations* (WHO 2010b).

Landmark report on education is released by an independent Global Commission: *Health Professionals for a New Century: Transforming Education to Strengthen Health Systems in an Interdependent World*. The report sets forth key recommendations for improving the education and training of health professionals: nurses, midwives, doctors, and public health professionals (Frenk et al. 2010).

2011

Global Health Workforce Alliance convenes the Second Global Forum on Human Resources for Health in Bangkok.

Global Health Workforce Alliance releases report, *Reviewing Progress, Renewing Commitments*, on progress achieved toward reaching the 2008 Kampala goals. The report concludes, “While actions on the ground in a number of countries are starting to make a difference, considerable work remains to be done to implement fully the Kampala Declaration and Agenda for Global Action in the majority of priority countries” (GHWA 2011c, 10).

G8 renews 2008 workforce commitments in *Deauville Accountability Report: G8 Commitments on Health and Food Security* (G8 2011).

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Box 2, continued

World leaders from 135 countries, convened at the Sixty-sixth UN General Assembly, support resolution to control and prevent noncommunicable diseases (NCDs) that include cancer, cardiac diseases, chronic respiratory diseases, and diabetes (UN 2011). The assembly stated that "[they] recognize the critical importance of strengthening health systems, including health-care infrastructure, human resources for health, health and social protection systems, particularly in developing countries to respond effectively and equitably to the health-care needs of people with [NCDs]" (ibid.).

2012

Global Health Workforce Alliance issues *The Global Health Workforce Alliance Strategy, 2013–2016: Advancing the Health Workforce Agenda within Universal Coverage* (GHWA 2012d).

World leaders at the Sixty-seventh UN General Assembly adopt resolution for governments to plan and pursue transition to universal health coverage (UN 2012).

WHO issues guidlines on task shifting titled *Optimizing Health Worker Roles to Improve Access to Key Maternal and Newborn Health Interventions through Task Shifting* (WHO 2012b).

2013

Third Global Forum on HRH planned for November 2013, Recife, aims to elicit "new HRH commitments to accelerate progress, and to update the HRH agenda to make it relevant to the current global health policy discourse, including the final push to accelerate progress towards attainment of the health MDGs, the universal health coverage objective, and the discussion on post-2015 health development priorities" (Recife FWG 2012, 2). Further, "countries, development partners and HRH stakeholders . . . will be invited to make explicit commitments, whether funding- or policy-related, around the actions required to overcome HRH barriers, improve coverage and attain UHC" (ibid., 3).

GLOBAL HEALTH CARE WORKFORCE

> *The close correlation between access to skilled, motivated and supported health workers, and maternal and child health is well established—the message is inescapable when 53 countries out of the 68 with the highest burden of maternal and child deaths suffer from an acute shortage of health workers.* (—M. Sheikh, GHWA 2010a, 26)

Health workers, from community-based providers to health professionals, contribute to the infrastructure that defines a health care system. The WHO defines health workers as individuals "whose main activities are aimed at enhancing health" (WHO 2006b). This definition appropriately includes family members or friends who provide a substantive amount of home care without compensation. This broad definition, however, confounds clear assessment and tracking of HRH data. Regulatory issues, such as licensure, vary from country to country and further complicate assessment of the stock of the workforce. Health care administrators and managers, as well as finance and information specialists, are also key members of the workforce.

WHO tracks health workers by category and reports these data in its Global Atlas (WHO 2011a). This aggregated dataset includes estimates of the number and density of health workers for nine occupational categories: (1) nurses and midwives; (2) physicians; (3) dentistry workers; (4) pharmacy workers; (5) laboratory workers; (6) environmental and public health workers; (7) community and traditional health workers; (8) other health service providers; and (9) health management and support workers. For some countries, disaggregated data estimates of the stock of health workers are available for up to eighteen occupational categories.

Nurses, midwives, and doctors are the core of the professional health workforce, and as of 2013, these three cadres comprise the minimum target of 2.3 health workers per 1,000 population. The recent report, *Health Professionals for a New Century*, focuses on nurses, physicians, and public health workers as three cadres of professional health workers that require improved, modernized education and training to meet the demands of our era (Frenk et al. 2010). The majority of health workers in most LMICs are employed as civil servants. Macroeconomic policies, generally imposed by agreements with international lenders, establish budget ceilings on public expenditures in many countries (Brownbridge 2004), and/or wage ceilings in the public sector (Odaga and Lochoro 2006). Under these conditions, Ministers of Health are particularly challenged to secure budget approvals to support the needed numbers and adequate remuneration of health care workers. Working with their fellow Ministers of Finance and Education, Ministers of Health are typically required to provide compelling evidence to overcome the fiscal restrictions to increase budgets. The G8 and the Kampala Declaration support removal of these policy restrictions (G8

2008; GHWA 2008b). The American Public Health Association and others have also called for removal of these structural budget limits (APHA 2005; Vujicic, Ohiri, and Sparkes 2009). These are among a number of obstacles that undermine retention of health workers and leave them underpaid, undersupported, and in some settings, unemployed despite the paradoxical HRH shortages and public sector vacancies.

Health Care Professionals

Nurses and midwives. Professional nurses and nurse midwives constitute the backbone of health systems and are particularly affected by health worker shortages and weak health systems. Nurses and those health workers they supervise provide an estimated 85 percent of health care globally (WHO 2006b). The lack of nurses prepared at advanced levels in LMICs to serve as faculty contributes to nurse shortages, limits the availability of doctoral programs to educate new faculty, and creates gaps in the production pipeline in these settings (Ketefian 2008; Ketefian et al. 2005). Advocacy is often essential to drive an agenda to advance the profession (IOM 2010; Ketefian et al. 2005). In recent years, attention to and advocacy for nursing workforce issues have increased in low- and high-income settings alike (ICN 2008; IOM 2010; NYAM and JCNE 2006; Reid and Weller 2010).

Physicians. The physician cadre constitutes the smallest available number of health workers in health systems, which is in large part attributed to the intensive time and resources needed for their training. In most settings, physicians dominate leadership lines. Ministries of Health, international health and policy entities, such as the WHO, and health systems are often led by physicians.

Associate clinicians. Increased demand for health services is prompting the education and training of greater numbers of associate/advanced associate clinicians and others as providers of primary care. These include nurse practitioners and physician assistants, and in LMICs, "clinical officers" and similarly named professionals. These professionals are often nurses with an additional one or two years of education. In low-income settings, individuals are often recruited from rural and poor areas, and some have specialty training. Associate clinicians have delivered "essential clinical services in countries around the globe for decades, as part of a comprehensive health workforce system that includes doctors, nurses, midwives, managers and administrators" (HSSE 2013). A growing number of studies demonstrate equivalent, or sometimes improved, quality of care and patient outcomes for those under the care of associate clinicians (Laurant et al. 2009; WHO 2012b). Lower educational costs, shorter training time, and successful rural placements suggest that these practitioners could have substantial roles in the scale-up of health workforces in sub-Saharan African countries (Dovlo 2004; Laurant et al. 2005; McAuliffe, Bowie et al. 2009; McAuliffe, Manafa et al. 2009; Mullan and Frehywot 2007). A study of job satisfaction among this cadre indicates that, while pay is an important element, career ladder opportunities and

satisfaction with work assignments are also significant (McAuliffe, Manafa et al. 2009). As these health workers become an increasingly important component of the workforce, more investment is needed in their education, training, deployment, and retention.

Other cadres. While we focus much attention on nurses, physicians, and midwives, the health pyramid includes other important frontline health workers with specialty skills. These cadres include dentists and other dental professionals, laboratory workers, radiology and imaging technicians, physical therapists, pharmacy workers, public health workers of all kinds, administrators and managers, health information specialists, and others. Staffing a complex health delivery institution requires attention to all these groups (Ozgediz et al. 2008).

Community health workers. Countries are increasingly investing in community health worker programs and learning important lessons about what works and what does not. Community health workers require resources for ongoing training and supervision (Fulton et al. 2011; Hermann et al. 2009; Sibley and Sipe 2004). These programs should be aligned with the broader goals for health systems strengthening (Frenk et al. 2010; Hermann et al. 2009). Retention of this vital cadre is key. Attention to and evaluation of various strategies, including adequate remuneration, are important to retaining these locally connected workers (Perry and Zulliger 2012; Stilwell 2011).

Moving beyond cadre-specific models, providing the right skill mix from combinations of cadres at the right location has potential to increase access to and efficiency of the delivery of health services by distributing tasks and functions across the health workforce (GHWA 2010d; Lewin et al. 2010; WHO 2012b). Important research questions related to task sharing include what is an appropriate regulatory framework for various provider types including associate clinicians, what is the appropriate balance between quality and cost, and what is politically, practically, or fiscally feasible (Fulton et al. 2011; WHO 2008a).

Education and Training

> *The total global expenditure for health professional education is about US$100 billion per year, again with great disparities between countries. This amount is less than 2% of health expenditures worldwide, which is pitifully modest for a labour-intensive and talent-driven industry. . . . Stewardship, accreditation, and learning systems are weak and unevenly practised around the world.* (—Frenk et al. 2010, 2)

Education of professional health care workers. Any effort to increase the number of health workers requires a significant investments in pre-service training provided by universities, schools of nursing, and other training institutions. The primary barriers to expansion of these institutions are the lack of available faculty and resources to support them (Mullan et al. 2011). The Global Commission's report on education cites multiple shortfalls in the health system but singled out the

failure of many nations to protect and advance their higher education systems (Frenk et al. 2010). In recent years, private sector programs have expanded, sometimes with corollary quality concerns. For-profit schools attract individuals who will pay substantial tuition to obtain education and training that allows them to migrate to high-income countries. The WHO is developing guidelines to assist countries in aligning health education efforts with population needs (WHO 2010b).

Competence and regulatory issues. Quality of care is intertwined with clinical competence. The quality of pre-service and continuing education and training, as well as periodic evaluation of training programs, are integral to the competence of health care workers. Governments and professional organizations are the responsible agents to ensure effective regulatory standards, such as accrediting professional training programs and licensure. In this spirit, the International Council of Nurses calls for countries to adopt competence-based approaches in setting practice standards (ICN 2008; Reid and Weller 2010). Debate over scope of practice, lack of political voice, and lack of clear leadership often confound regulatory change (IOM 2010). And, changes in regulatory frameworks are often challenging to implement at the country level (Bateganya et al. 2009).

Retention of Health Workers

> *Financial incentives alone are not enough to motivate health workers. It is clear that recognition is highly influential in health worker motivation and that adequate resources and appropriate infrastructure can improve morale significantly.* (—Willis-Shattuck et al. 2008, 247)

Migration of professional health workers is a growing phenomenon with serious consequences for the communities left behind (Xu and Zhang 2005). Ultimately, the ideal way to stem migration driven by worker dissatisfaction is to improve the health system in which they work (Hongoro and Normand 2006; Mills et al. 2008). Often frustrated by a weak health system, infrastructure, and poor living conditions, health workers who choose to migrate to high-income countries are typically drawn by the promise of higher salaries and better working conditions (Adelberger, Neely-Smith, and Hagopian 2011; Hagopian et al. 2003; Hagopian, Thompson, Kaltenbach et al. 2004; Hagopian, Thompson, Fordyce et al. 2004; Hagopian et al. 2005; Hagopian et al. 2009; Hart et al. 2007; Hongoro and Normand 2006; Mullan 2002; Nguyen et al. 2008; Perrin et al. 2007). The loss of health professionals from poor to rich countries is associated with high costs. The overall loss of returns from investment for African doctors working in four English-speaking destination countries was estimated to exceed $2 billion, with costs for each of nine countries ranging from $2.16 million for Malawi to $1.41 billion for South Africa (Mills et al. 2011).

While many high-income countries are heavily reliant on nurses and physicians from lower-income countries (Dumont and Zurn 2010), leaders and professional groups have advocated for an end to unethical recruitment (AEIRP 2011; AONE 2003; WHO 2010c). Problems with retention are also a within-country issue that can lead to internal brain drain as workers move within-country from public to private or NGO health settings (Pfeiffer et al. 2008). National and international health workforce tracking systems are needed to better understand and manage worker retention (Middleberg 2010).

As part of their strategic planning, national and local leaders, together with all cadres of health workers, need to adopt and evaluate strategies that incentivize health workers to work in geographic areas where they are needed, including attention to fair compensation (Hongoro and Normand 2006; Stilwell 2011). Historically, Ministries of Health have been marginally successful in systematically incorporating retention mechanisms into strategic plans and practices. We know that assigning health workers with roots in their home rural areas is more likely to be successful. We also know health workers value strong primary and secondary education for their children, which is hard to come by in rural areas; we know they value access to good practice information, resources, and collegial relations; and we know that they value remuneration and recognition. A comprehensive study of motivational factors associated with health workforce retention identified several significant themes: financial rewards, career development, continuing education, clinical infrastructure, resource availability, facility management, and recognition/appreciation (Zurn et al. 2004). A systematic review of twenty retention studies in low-income settings similarly identified that workers value and are motivated by recognition, adequate resources, and infrastructure (Willis-Shattuck et al. 2008).

Although access to health care for those living in both rural and urban settings depends on retaining health workers where they are needed (APHA 2005; Mullan 2002; Zurn et al. 2010), most countries struggle to attract and retain health workers in rural areas. And while the majority of the population in most poor countries resides in rural areas, people living in LMICs are increasingly migrating to urban areas. It is now estimated that 75 percent of all people will spend some of their lifetime in a city. These urban centers are ill equipped, especially in terms of infrastructure—water, power, and housing—to accommodate a growing influx of citizens.

Across settings, retention requires sound domestic practices and foreign policies (WHO 2010b, 2010c). Such policies include self-sufficiency strategies that reward clinical practice in rural and underserved areas for in-country medical graduates (WHO 2010b), and strategic, long-term models to tackle the shortage of professional nurses in high-income settings (Hagopian, Thompson, Fordyce et al. 2004; Kahn, Hagopian, and Johnson 2010; Mullan, Frehywot, and Jolley 2008). High-income countries need to incorporate domestic strategies to locally educate and retain physicians to reduce the reliance on importing health professionals from low- and middle-income countries (IOM 2010). The challenge before all health leaders is to implement practices

that are responsive to the needs of their health workers and the populations they serve and are considerate of the larger global community.

STRATEGIC PLANNING TO STRENGTHEN HRH

Ministries of Health

Ministries of Health have the fundamental responsibility for health in their countries. Governments, as stewards of the public's interest, have the ultimate responsibility for ensuring conditions that foster health. The essential role of government was underscored in the Abuja Declaration, wherein heads of African Union countries agreed to increase their expenditures on health to 15 percent of their total budget (WHO 2003). Yet, follow-up data to assess achieving this target are disappointing: just three of the forty-six countries are on track, sixteen are making progress, and the remaining twenty-seven countries have made insufficient progress (WHO 2011b).

Building effective health systems requires multiple skills, including policy development, financial management, regulation, evaluation, quality assurance, surveillance and research, supply chain, data management, information technology, health promotion, disaster management, and of course, human resources development and training (Omaswa and Boufford 2010). Given health systems' complexities, a systems-based approach is seen as fostering more effective strengthening of health systems (de Savigny and Adam 2009). Country-level ownership is fundamental to strengthening HRH. Country HRH plans should (1) include financing mechanisms for salaries and other supports; (2) set forth regulatory frameworks regarding scope of practice by cadre and address working conditions and safety matters; (3) provide for accountability and management; (4) ensure pre-service and in-service training; (5) prioritize community mobilization and outreach; (6) make provision for private/public sector alignment; (7) mobilize leadership for strategy; and (8) establish information and reporting systems (GHWA 2010b). These plans are the critical first steps to making and measuring country progress. The 2008 Kampala Declaration established the Agenda for Global Action on health workforce issues (GHWA 2008b) and has tasked the Alliance with monitoring progress (table 1).

TABLE 1. AGENDA FOR GLOBAL ACTION: STRATEGIES AND INDICATORS

Strategy	Measure
1. Build coherent national and global leadership for health workforce solutions	Number of countries that have developed costed evidence-based HRH plans Number of countries with an intersectoral coordination mechanism for involving relevant stakeholders in HRH development
2. Ensure capacity for an informed response based on evidence and joint learning	Number of countries with a national mechanism with processes or tools for HRH data users and producers to inform policymaking and management of the health workforce (e.g., HRH observatory) Number of countries that have a well-functioning HRH information system
3. Scale up health worker education and training	Number of countries having implemented programs to increase the production of doctors, nurses, midwives, and/or community health workers
4. Retain an effective, responsive, and equitably distributed health workforce	Number of countries implementing strategies and approaches for attracting and retaining the health workforce in underserved areas
5. Manage the pressures of the international health workforce market and its impact on migration	Number of countries implementing policies to favor in-country retention of personnel

Continued

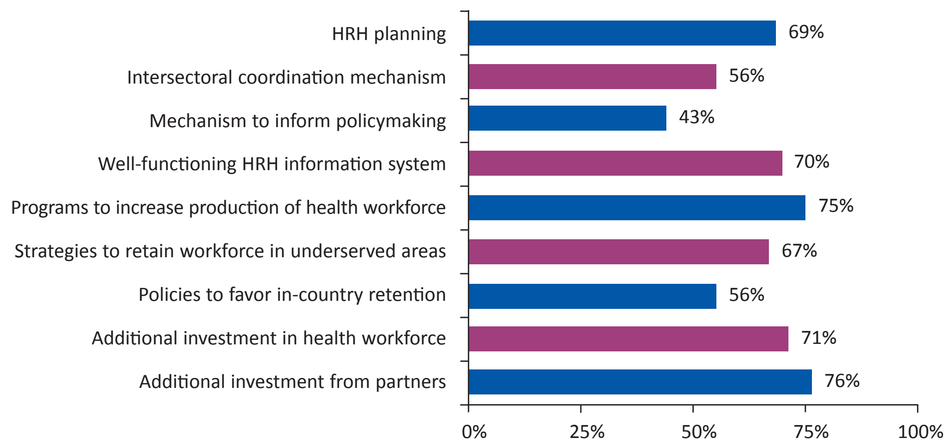
Table 1 continued

Strategy	Measure
6. Secure additional and more productive investment in the health workforce	Number of countries in which budgetary allocations for community health workers as a proportion of the health sector budget have increased Number of countries that have received additional investment from multilateral and bilateral partners for the implementation of HRH plans

Source: Adapted from GHWA 2011c, 16.

In preparation for the Second Global Forum on HRH in Bangkok, the Alliance surveyed the fifty-seven crisis countries to assess their progress toward these goals. Of the fifty-one countries responding, forty-four (86 percent) indicated progress in developing their HRH plans; of these, twenty-nine countries reported that they had begun to implement their plans (figure 1) (GHWA 2011b; IRIN 2011). Of the countries responding to this same survey, thirty-two indicated that they were adopting strategies to retain health workers in underserved areas (GHWA 2011b).

FIGURE 1. COUNTRY PROGRESS IN HRH INDICATORS



Notes: Consolidated scores across the nine HRH indicators show highest performance in securing support from development partners for HRH plans and increasing HRH production. Lowest scores are in existence of mechanisms to inform policymaking through data, the inclusiveness of HRH coordination mechanisms, and strategies to favor in-country retention.

Source: GHWA 2011c. *Reviewing Progress, Renewing Commitments: Progress Report on the Kampala Declaration and Agenda for Global Action*, 17, http://www.who.int/workforcealliance/knowledge/resources/KDAGAprogressreport_2011.pdf. Geneva: Global Health Workforce Alliance. Reprinted with permission.

Further analyses of these same data suggest that presence and implementation of a health workforce plan is important to stimulate related action despite other contextual conditions such as resources and available health workers (Witter et al. 2013). In 2008, the G8 reiterated the importance of country-level HRH strategies coupled with long-term commitments by donors in its declaration on the importance of health systems strengthening as part of the international agenda. The declaration is significant for its strong stand on two controversial issues: opposing macroeconomic policies that limit the ability of low-income countries to spend public sector funds on health and education, and limiting health workforce migration (G8 2008). Additional recommendations to the G8 were identified through the cross-sectoral efforts of interest groups and civil society and outlined in the Track 2 strategy (box 3) (Reich and Takemi 2009).

BOX 3. OPPORTUNITIES FOR G8 TO STRENGTHEN THE GLOBAL HEALTH WORKFORCE

Strengthen capacity of countries to plan, implement, and assess health workforce programs so that they can more effectively use existing health workforce and G8 commitments:

- Develop assessment mechanisms for health workforce progress within countries.
- Identify ways to change macroeconomic policies to reduce constraints on expanding the health workforce.
- Strengthen international networks of higher education institutions to provide access to health and medical education in areas with few resources.

Address demand-side causes of international health worker migration:

- Increase number of health workers in their own countries with their own resources.
- Support the WHO code of practice to address migration issues.
- Seek practical solutions that protect both the right of individuals to seek employment through migration and the right to health for all people.

Undertake a yearly review of actions by G8 countries to improve the health workforce:

- Assess what G8 countries are doing, what has worked along with evidence of effective strategies, with a standard set of common measures.
- Use this review to assess how health systems are doing, to identify gaps in financing and information, to develop evidence-based best practices, and to increase knowledge about how to improve health systems performance through strengthening human resources, as well as to see how well G8 countries are carrying through on what they pledged.

Source: Reich and Takemi 2009, 509–10.

Follow-up reports on G8 member activities in health workforce indicate their support, especially in the African region, with bilateral and multilateral organizations and the Alliance (G8 2011, 3). The Deauville Accountability Report indicates that more than 40 percent of the $60 billion pledge (years 2008–2012) by G8 member countries was dispersed in 2008 and 2009 (ibid.).

The Institute of Medicine (IOM) similarly emphasized the importance of country-level HRH planning and urged bilateral and multilateral donors to make long-term, dependable investments toward the progress of country-led plans (box 4) (IOM 2009).

BOX 4. INSTITUTE OF MEDICINE RECOMMENDATIONS FOR GLOBAL HEALTH

Support country-led health sector workforce plans:
The IOM found that while low-income countries are the owners and drivers behind national strategic plans to improve the health workforce, in many instances, the success of these plans is dependent on external donor assistance. As much as 50 percent to 85 percent of the recurrent health care budget of some countries in sub-Saharan Africa is consumed by salaries for health care providers. Large increases in funding, no matter what the source, are therefore necessary to scale up human resources for health.

The current model of donor assistance does not support the long-term, country-led investment that is required to help finance nationally owned strategies for developing human resources for health. Development assistance and donor grants tend to be unpredictable, volatile, and short-term, making it difficult for recipient governments to make long-term investments or to plan budgets using external assistance. Funds for hiring workers need to be stable and long-term in order to cover recurrent costs, such as salaries. Governments, therefore, may not wish to expand their health workforce any faster than is sustainable in the long term with domestic resources.

Source: IOM 2009, 123.

Health systems use a variety of methods to determine the appropriate level of staffing required to meet the needs of their respective populations. While some call for increasing the minimum ratio of health professionals to 2.5 doctors, nurses, and midwives per 1,000 population, a revised ratio ideally would include other clinical cadres, including midlevel and community health workers. While one may quibble about 2.3 or 2.5 as the minimum ratio to provide immunizations and attend births, and some have,[2] if all countries achieve the goal of 2.3 health professionals it would demonstrably advance health status in countries with greatest need. Debate about the minimum ratio of workers to population is germane given the relationship of health worker density to key population health outcomes (figure 2). What remains undisputed is that better HRH information and reporting systems are needed.

FIGURE 2. HEALTH WORKER DENSITY AND HEALTH OUTCOMES

Source: Speybroeck, N., Y. Kinfu, M.R. Dal Poz, and D.B. Evans. 2006. *Reassessing the Relationship between Human Resources for Health, Intervention Coverage and Health Outcomes*, 8, www.who.int/hrh/documents/reassessing_relationship.pdf. Background Paper for *The World Health Report 2006*. Geneva: World Health Organization. [Author calculations based on WHO data.] Reprinted with permission.

A reliable information system to track health workforce is essential to a functioning health system. One of the six "building blocks" of health systems (WHO 2006b), health information allows managers and researchers to track and evaluate the effect of health systems interventions. These systems require adequate energy sources and technical investment (Lucas 2008; Nyamtema 2010). Ministries of Health are starting to invest in information systems to track licensed health professionals; however, links to other systems, such as degree-granting schools, job deployment assignments, or continuing education systems, are limited (Spero, McQuide, and Matte 2011). This is an area of need ripe for capacity building in low-income settings.

Nontraditional approaches to strengthening health systems and human resources are being adopted in some settings (Acumen Fund 2013; Sekhri, Feachem, and Ni 2011). These include performance-based incentives (Soeters and Vroeg 2011) and entrepreneurial models funded with private investments. Evaluations of the effect of pay for performance have been

mixed, showing short-term benefits, but are unclear on long-term effectiveness (Oxman and Fretheim 2009). Some critics of profit-generating models view them as antithetical to public service-based and traditional NGO-driven efforts. Others believe that heterogeneous strategies have potential to stimulate innovation and effectively engage new actors (Soeters and Vroeg 2011).

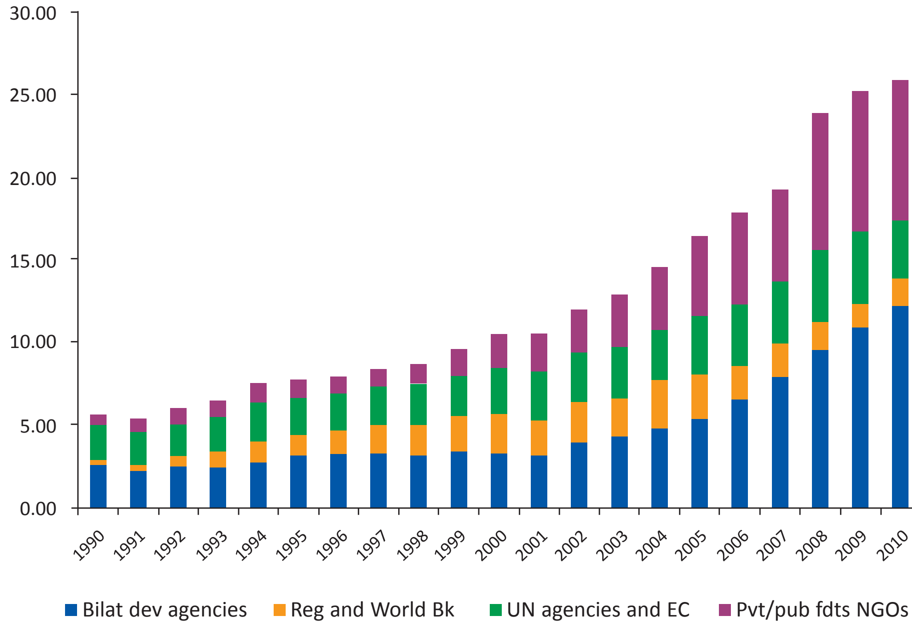
INVESTING IN THE HEALTH WORKFORCE

The Millennium Development Goals are not achievable without investments to educate and retain a competent global health workforce.

Health care is, by definition, a human resource–intensive enterprise. Substantive improvements in health status require complex, strategic, sustained, cross-sectoral investments of resources and technical assistance. Neither the numerous advances in technology nor a more informed patient population can replace the competent health care provider, who, through her skilled practice, assesses, intervenes on behalf of, and educates patients. In some LMICs health workers' salaries account for 50 to 85 percent of health care costs (IOM 2009). Often donor funding of human resources is absent or, at best, modest despite the cost of employing a health workforce. Donors need to be informed about HRH needs and engaged to fund the health workforce broadly or as a proportion of their support of specific vertical programs. These resources, directed through Ministries of Health and other government divisions, are necessary for real progress (McCoy et al. 2005; Pfeiffer et al. 2008).

Currently, multilaterals and governments provide the major proportion of global health support through official development assistance (ODA) (figure 3). Low-income countries vary in their dependence on ODA for health. While most sub-Saharan and a number of Southeast Asian countries are largely aid-dependent, there are several that receive relatively little aid. In 2010, India received just 1.23 percent and Nigeria 9.2 percent of their total expenditures on health through ODA. However, private out-of-pocket spending on health during the same year in these countries was 70.8 percent and 62.1 percent, respectively (WHO 2013a).

FIGURE 3. DEVELOPMENT ASSISTANCE FOR HEALTH BY SOURCE 1990–2010



Notes: Figures are US$ billions (2008). Data for 2009 and 2010 and NGO data for 2008 were updated using data from IHME.

Sources: Figure adapted from Murray et al. 2011, 8; data from IHME 2010, Statistical Annex, Table 1.

The ability to track investments in health systems strengthening and HRH from donors or national government funding is important to inform leaders, funders, and policymakers. Funders appropriately expect responsible stewardship, accountability, transparency, and, more recently, evaluation metrics. Multi- and bilateral donor investments in specific programs have the potential to influence government commitments if recipient governments subsequently reduce the amount of funding appropriated to the targeted programs following an influx of external funds. To ensure that donor funds provide "additionality" to these programs, it is incumbent on leaders, on both the donor and recipient sides, to develop mechanisms that track investments and promote transparency (Garg et al. 2012). However, as the following OECD example demonstrates, it is difficult to assess global HRH funding.

The OECD annually tracks, by sector, the ODA funding support from the twenty-four member governments that comprise the Development Assistance Committee (DAC) and

multilaterals. Currently, the ability to map funding of HRH from OECD's health sector reporting is limited by the taxonomy that defines the sectors and subsectors. There is no discrete subsector for HRH-associated funds. For example, reports of ODA funding for health in LMICs combine the *health* and *population policies* sectors with the *program* and *reproductive health* sectors, and the subsectors *other social infrastructures* with *services-social mitigation of HIV/AIDS* (Kates, Wexler, and Valentine 2011). The *management and workforce* subsector includes data for five CSR subsection codes: health policy and administrative management; medical education and training; medical research; basic health infrastructure; and health personnel development. In addition, costs associated with HRH are included in other subsectors, such as the *family planning/reproductive health* subsector (ibid.). Finally, there is no centralized source of data for non-DAC nations funding of HRH and no repository for private funding for HRH from foundations or private industry. In sum, we cannot directly track the funds invested into the health workforce

While major donors such as GAVI, The Global Fund, and the World Bank support short-term training of health workers and provide remuneration for health services delivered through their programs, improved coordination between these organizations and national governments is called for to improve the efficiency and effectiveness of their support (Vujicic et al. 2012).

There are several strong examples of donor contribution to HRH, both in terms of funds and as contributions to policy. Norway has invested in the Global Health Workforce Alliance. It provided leadership in negotiating a stronger Code of Conduct on the International Recruitment of Health Personnel (the Code) and committed to not actively recruit health workers from low-stock countries and to fund the training of its own health care workforce. Britain developed its own code eschewing the recruitment of health personnel from abroad (UK DOH 2004). Canada has invested considerably in becoming more self-sufficient to avoid recruiting health workers from low-income countries. India and Japan hosted health workforce sessions at the UN General Assembly in September 2011. An analysis of the UK's ODA support for health in 2008–2009 reports that the Department for International Development provided £90 million, and of this, 25 percent was directed to HRH (Campbell, Jones, and Whyms 2011). The United States continues to make significant investments in global health, including funding of PEPFAR, which began in 2004 during the Bush administration and continues with a health systems strengthening approach during the Obama administration (US OGAC 2005; US GHI 2012).

Initial analysis of PEPFAR efforts appears to support a health systems strengthening effect related to HIV and life expectancy, but further study is needed to assess other, more distal health outcomes (Cohen et al. 2012). Under PEPFAR's Reauthorization Act of 2008, the US government committed to train 140,000 new health workers. The PEPFAR Medical and Nursing Education Partnership Initiatives (MEPI, NEPI) pair health-training universities in low-income countries with collaborating universities in the United States. In 2012, US government funds were committed

directly to the Rwanda Ministry of Health for a seven-year, national HRH program that aims to strengthen health professional education and production (Rwanda MOH 2012).

Investments by interest groups and NGOs, such as Health Workers Count, Save the Children, and the Frontline Health Workers Coalition, include campaigns to promote the health workforce and raise awareness of global HRH issues (FHWC 2012b; Save the Children 2011a, 2011b). In 2011, Save the Children launched a campaign, The Good Goes, since renamed Every Beat Counts, which employs the message that health care workers are central to the health and saving lives of children across the globe (Save the Children 2011b).

Health Care Workforce and Population Health

Health depends on access to prevention, health promotion, treatment, and rehabilitation. Efforts to achieve the MDGs have brought new understanding of the complexities that define health systems and the irreplaceable roles of health care workers. The decision to invest in the workforce has long-term payback value. Compared to investments in technology, workers do not become obsolete. They multiply investments by teaching others, improving their own and others' socioeconomic status, benefiting the community, and supporting salutary, systemic change. While there are good arguments to be made that the most important investments to advance population health status are in the structural determinants of health such as poverty reduction, education, narrowing of the income gap, and the like, data suggest that the health system itself, and health workers in particular, make unique and substantial contributions to health status (GHWA 2011a; WHO 2011a).

The infectious diseases HIV, tuberculosis, and malaria received the largest proportion of funding in recent years with demonstrated results (Salaam-Blyther 2010). Although targeted funding of such programs introduced some unintended consequences, including redistributing scarce health workers, it has allowed for the notable progress made in the prevention and treatment of HIV/AIDS, malaria, and TB. Today, other health challenges loom. NCDs are increasing the disease burden and health costs, especially in lower- and middle-income countries. There are 36 million deaths per year from NCDs, which account for more than half (58 percent) of the deaths worldwide (Abegunde et al. 2007; WHO 2010a, 2012c). And, NCDs were the focus of a high-level meeting of the UN General Assembly in September 2011 (UN 2011).

The debate continues over the competing benefits of vertical health programming that focuses on single disease issues versus systems-wide investments that integrate care of specific diseases into existing primary care systems (Gostin et al. 2010; Hill et al. 2011). Those who advocate for a vertical funding approach argue that donors are not generally motivated by broad systemic investments and rather seek immediate results from their contributions. Yet, as

life expectancies and the prevalence of chronic diseases increase, funding integrated care models can minimize the unintended consequences and higher costs associated with siloed programs, and offer the potential for more efficient use of funding and human resources for health.

Progress on maternal, newborn, and child health outcomes is heavily reliant on the health workforce. We have learned that childbirth emergencies, the leading cause of maternal deaths, can only be managed by competent professional health workers, including midwives (box 5) (Bhutta et al. 2008; WHO 2012b). Further, childhood immunizations along with the management of childhood illnesses are extremely reliant on health workforce staffing levels (ibid.).

BOX 5. MATERNAL, NEWBORN, AND CHILD SURVIVAL

Measures to shift complex tasks to low-level health workers merely a stopgap: Although the development of a cadre of community health workers might be an appropriate short-term solution to pervasive MNCH [maternal, newborn, and child health] problems, this effort should not detract from the need to strengthen the health system and the training of staff. Thus, such community-based approaches must be seen in the context of evolving health systems and roles. . . . Barefoot doctors in China have been phased out as the health system strengthened. In Iran, the role of Behvarz workers has evolved from providing curative services to a largely promotive role as literacy rates have improved and the health system strengthened. Thus, although alternative strategies exist, such as training technicians to do caesarean sections in situations where surgeons are not available, these measures must not replace concerted efforts to train an appropriate health workforce.

Source: Bhutta et al. 2008, 985.

Public health workers who can address health promotion and prevention of disease and injuries are in short supply and poorly supported worldwide (Beaglehole and Dal Poz 2003; Petrakova and Sadana 2007). The reduction of unintentional injuries is highly reliant on public health professionals (Alwan et al. 2010). Implementing a comprehensive health systems strengthening agenda requires ramping up the production of skilled public health professionals to meet the health challenges of this century (Horton 2009).

Foundations

While the fundamentals of workforce planning, production, placement, and retention are in the purview of government, private foundations, family funds, and individual philanthropists historically have supported and continue to support workforce innovations. Foundations have a long and productive history of investing in leadership development in related sectors. Wealthy industrial leaders of the last century made especially significant investments. In the United States, philanthropists Rockefeller, Ford, and Carnegie viewed their gifts as a means to “change the human condition by, for example, addressing inequities, improving health, and spurring education and research” (Spero 2010). Comparative advantages of private funders include their flexibility, capacity to be innovative, and ability to make and implement funding decisions more rapidly than government funds can be mobilized.

Many US donors follow this philanthropic legacy. From 1990 through 2008, philanthropic giving dramatically expanded. Reflecting the healthy US economic conditions during the 1990s and well into the decade that followed, both foundation assets and giving increased. In 1990, foundation assets tallied $143 billion; by 2008, foundations reported assets of $565 billion. Giving increased from $8.7 billion in 1990 to $46.8 billion by 2008 (Spero 2010). Since 2008, volatile economic conditions in the United States and globally have slowed philanthropic giving, and undermine future predictions. Total giving by the 76,000 US–based foundations dropped by 2.2 percent in 2009, remained flat in 2010, and increased by 2.2 percent to $46.9 billion in 2011, although below the 2008 peak after adjusting for inflation (Lawrence 2012).

Today, with the exception of a relatively short list of foundations, the majority of private philanthropies lack experience funding global health. Advocates of HRH stress the importance of evidence to guide funders and call for increased resources to build the global health workforce (Frenk et al. 2010; FHWC 2012b; GHWA 2008a, 2011a, 2012b, 2012d; WHO 2006b, 2012a). Even among those funders with an interest in global health, few understand the resource needs associated with human resources for health. And, recent studies document the paucity of information on funding for and tracking of human resources for health (Garg et al. 2012; Murray et al. 2011; Kates, Wexler, and Valentine 2011).

Evidence-based investments by foundations and the private sector can be effective. There are a number of programs that have targeted the health workforce. Some have made progress on a country level; others have focused on the growth of particular cadres. Select examples of foundation and corporate philanthropy investments are included here, but this listing is by no means all-inclusive. A key challenge is how to better track both the programmatic experience in HRH and the collective resources that are invested in the health care workforce from all funding sources.

The Aga Khan Foundation has played a leading role in establishing nursing schools in Pakistan, Kenya, Uganda, and Tanzania since 1980. The Aspen Institute Ministerial Leadership

Initiative is using a practice-based model of leadership development to strengthen capacity within Ministries of Health (MOH). The Atlantic Philanthropies invested in Vietnam's public health and primary care systems as well as in medical education in Cuba. The Bill & Melinda Gates Foundation contributes to the field of HRH. For example, it supported the Rockefeller Foundation–led JLI Report, and in partnership with the Packard Foundation, the Gates Foundation funded a fellowship program for midlevel public health officials from low-income countries. The Gates Foundation maintains its prime focus is on technological solutions to health problems, most notably through vaccine development. However, it has a program under way in India to address health systems issues.

The Clinton Health Access Initiative (CHAI) works by invitation from national governments. Specific programs in HRH include hospital staff productivity in Ethiopia; nursing deployment in Kenya; task shifting in Lesotho; workforce pipeline analysis in Zambia; a new cadre of laboratory technicians in Malawi; the use of "expert patients" to enhance counseling and testing in Nigeria; and a major partnership with the government of Rwanda and US schools of nursing, medicine, and dentistry (CHAI 2012). Started in 2005 by US President Bill Clinton, the Clinton Global Initiative (CGI) has leveraged 2,300 commitments that, when fully funded and implemented, will be valued at $73.1 billion (CGI 2012). Many of these commitments target or affect the health workforce.

The Doris Duke Charitable Foundation specifically noted the importance of strengthening health systems in low-income countries. In 2009, the Duke African Health Initiative granted roughly $44 million over five to seven years to support four research partnerships to design and implement large-scale primary health care programs in sub-Saharan Africa. Johnson & Johnson's primary investments in Africa are related to direct service and support nursing and medical education programs.

The Rockefeller Foundation is notable for its support of the groundbreaking Joint Learning Initiative report on the global HRH crisis described earlier, as well as its important work to strengthen the capacities of Ministries of Health. Rockefeller, in collaboration with the Ford Foundation, is also known for its early work to establish demographic research programs in low-income countries in the second half of the 1900s.

Small foundations are also working in HRH and health systems strengthening. The Touch Foundation, working with Tanzania's Minister of Health, leverages funding to grow the health workforce and strengthen management in that country. Malawi's Health Research Capacity Strengthening Initiative, funded in 2009 by the Wellcome Trust, is a five-year project to develop medical research capacity and health systems research. A sampling of foundation-supported programs that is inclusive neither within or across foundations further illustrates donor funding of global human resources for health (Appendix 1).

GOING FORWARD

Guidance for Investing in Human Resources for Health

The Agenda for Action established in 2008 at the first Global Health Workforce Alliance Forum in Kampala and reiterated in 2011 in Bangkok provides a strategic foundation for donor investment opportunities in six key areas (Bhutta et al. 2008; GHWA 2008b, 2011a; MSH 2009):

1. **Leadership:** Build coherent national and global leadership for health workforce solutions.
2. **Evidence and joint learning:** Ensure capacity for an informed response, based on evidence and joint learning.
3. **Education:** Scale up education and training of health workers, including interprofessional and core competency training models.
4. **Retention, performance, distribution:** Retain an effective, responsive, and equitably distributed health workforce.
5. **Migration:** Manage the pressures of the international health workforce market and its effects on migration.
6. **Investments:** Secure additional and more productive investment in the health workforce.

The collective experience of foundations, the work of concerned bilateral and multilateral organizations, and the efforts of civil society to build long-term, sustainable collaborations in health systems strengthening and human resources for health are generating a growing list of best practices to guide donors:

Program design

- Align HRH programs to address the needs of the specific setting and workforce production plan while mindful of other factors that influence the HRH pipeline.
- Invest in the scale-up of proven model projects.
- Invest in infrastructure for leadership development, pre-service education and training, retention strategies, supervision, motivation, and tracking of health workers.
- Identify specific HRH needs: build a compendium of HRH needs by country, cadre, and category (education; retention) for funders to enter into collaborations of existing or new programs.
- Invest according to the most cost-effective strategy and skill mix required to address high-priority country needs.
- Invest long term: progress in HRH takes time and requires tenacity. Reliable investments allow countries to count on resources that support long-term plans.

Due diligence and program oversight

- Join in programs to strengthen health systems through HRH at the request of national governments that align and are integrated with national health strategies.
- Assess and secure interest of local stakeholders, establish accountability for HRH planning, and build country ownership.
- Assess and agree on funding priorities, scope, and duration of the program.
- From the outset, establish a recipient-donor agreement, including expectations of each collaborator. Agreements, while simple, should indicate responsibilities of stewardship, expectations on deliverables, quality measures, and program-specific metrics.
- Programs require vigilance from all actors, especially during start-up. At various stages, and typically during implementation, obstacles arise and unforeseen complications emerge that may require program adjustments.

Policy

- Generate knowledge to inform policy on recruitment, training, tracking, retention, productivity, quality, migration, and other issues.
- Build on knowledge generated by thought leaders.
- Utilize implementation science: model scalable projects that could be funded by bilateral or multilateral donors once they are found to be effective.
- Identify bottlenecks and opportunities where changes in government policy or usual practice could support the retention of health workers, such as infrastructure for training, housing, employing, supervising, motivating, and tracking health workers.
- Build enthusiasm and political support to produce and support health workers, both in countries with shortages and in countries that are pulling health workers away from their home countries.
- Invest in efforts to implement the WHO's Global Code of Practice on the International Recruitment of Health Personnel.
- Register with the Global Health Workforce Alliance so it can track best practices and lessons learned from ineffective practices and communicate these to the HRH community of practice.

Lessons

The 2011 Global Summit provided a rare, intimate, and safe place for candid discussion among its ninety participants, representing foundations, multilateral funders, US funding agencies, low- and middle-income government representatives, private for-profit corporations, and academia.

Participants concurred on the following as essential to advance the global health workforce:

1. Strong **commitments to strengthen and retain** an educated health workforce are essential to improve population health across settings.
2. Large-scale **advocacy** is needed to put a human face on health systems and workforce.
3. **Government commitments to invest in HRH** in low- and middle-income countries are essential to make progress in the health workforce crisis and to achieve country-by-country improvements.
4. Multiple, **cross-sector stakeholders** are required to improve health through human resources; private sector funders and foundations have a role to play in HRH.
5. Cross-sector players have not yet coordinated enough to effectively and efficiently respond to HRH challenges; these sectors need to **network, share resources, establish metrics, invest in research, and disseminate findings**.
6. Through necessary catalytic investments, stakeholders need to **improve networking and disseminate knowledge** more generally, tracking lessons learned and metrics of success.
7. Exciting experiments are happening in places that were not on the global health radar twenty years ago. We need to **expand the global reach to build collaborations** in different contexts to find ways to spread best practices in HRH.
8. Stakeholders should **develop centers on global human resources for health** to help advance work in health systems strengthening.

Improvements in health and the associated gains in economic indices call for strong, supported, and efficient health systems. Human resources for health are an integral part of functioning health systems; this reality must be addessed in any effective health systems stregthening effort. Health systems are complex, open systems, and efforts for sustained improvements should consider these complexities and engage key actors, including members of the community and civil society. Given current economic conditions and public sector constraints, private funders, working with national leadership, are encouraged to invest resources aligned with country priorities. Historically, foundations generated important social changes through risk taking. With their visionary leadership, ingrained ethic of social responsibility, and unique flexibility, private funders are important players in the emerging cross-sectoral partnerships in global health. As nimble and efficient funders, foundations and other donors can accelerate country-level progress in HRH that is required to achieve health targets and move health systems toward universal health coverage. Working with government leaders, they can support developing the evidence base for best practices, join in strategic cross-sector partnerships, and pilot approaches that can then be scaled up using multilateral and other large funding sources. Building a robust global health workforce requires the leadership of government officials,

including those at Ministries of Health, Education, and Finance, and the collaborative efforts of other key actors and civil society. Through collective, cross-sectoral talent, strategic investments, and political will, we can improve health for all.

ENDNOTES

[1] Associate clinicians (formerly called nonphysician clinicians) and advanced-level associate clinicians include assistant medical officers, clinical officers, clinical associates, surgical technicians, physician assistants, and advanced-practice nurses (WHO 2012b, Annex 1. Available at http://apps.who.int/iris/bitstream/10665/77764/1/9789241504843_eng.pdf).

[2] For example, Bossert and Ono (2010) propose targets based on devoting an achievable percentage of GDP to the health sector; maintaining an affordable level of public sector expenditure on health; using an appropriate share of health funds to pay salaries of health workers; and shifting skill mix to a more efficient and less costly combination of physicians, nurses, and midwives.

REFERENCES

AAAH (Asia-Pacific Action Alliance on Human Resources for Health). 2013. About. Available at http://www.aaahrh.org/aaah.php.

Abegunde, D.O., C.D. Mathers, T. Adam, M. Ortegon, and K. Strong. 2007. The Burden and Costs of Chronic Diseases in Low-Income and Middle-Income Countries. Review. *The Lancet* 370(9603):1929138.

Acumen Fund. 2013. About Us. Available at http://www.acumenfund.org/about-us.html.

Adelberger, A., S. Neely-Smith, and A. Hagopian. 2011. Estimating Nurse Migration from the Bahamas between 1994 and 2005: An Exploratory Descriptive Study Using a Social Network Identification Methodology. *Global Public Health* 6(7):732–45.

AEIRP (Alliance for Ethical International Recruitment Practices). 2011. *Case Study 1: The Sentosa 27 Court Opinions*. Washington, DC: Alliance for Ethical International Recruitment Practices. Available at http://www.fairinternationalrecruitment.org/images/uploads/CaseStudy1_Sentosa27.pdf.

Aiken, L.H., S.P. Clarke, D.M. Sloane, J. Sochalski, and J.H. Silber. 2002. Hospital Nurse Staffing and Patient Mortality, Nurse Burnout, and Job Dissatisfaction. *JAMA* 288(16):1987–93.

Altman, D.E., C. Clancy, and R.J. Blendon. 2004. Improving Patient Safety—Five Years after the IOM Report. *New England Journal of Medicine* 351(20):2041–43.

Alwan, A., D.R. Maclean, L.M. Riley, E.T. d'Espaignet, C.D. Mathers, G.A. Stevens, and D. Bettcher. 2010. Monitoring and Surveillance of Chronic Non-Communicable Diseases: Progress and Capacity in High-Burden Countries. *The Lancet* 376(9755):1861–68.

Anand, S., and T. Bärnighausen. 2004. Human Resources and Health Outcomes: Cross-Country Econometric Study. *The Lancet* 364:1603–9.

Anand, S., and T. Bärnighausen. 2007. Health Workers and Vaccination Coverage in Developing Countries: An Econometric Analysis. *The Lancet* 369:1277–85.

AONE (American Organization of Nurse Executives). 2003. *Policy Statement on Foreign Nurse Recruitment*. AONE Board of Directors, Chicago: American Organization of Nurse Executives.

APHA (American Public Health Association). 2005. *Expenditure Ceilings Imposed on Poor Countries Must Be Lifted to Achieve the Millennium Development Goals* (policy 2005-3). Washington, DC: American Public Health Association.

APHA (American Public Health Association). 2006. *Ethical Restrictions on International Recruitment of Health Professionals to the United States*. November 8. Washington, DC: American Public Health Association.

Bateganya, M., A. Hagopian, P. Tavrow, S. Luboga, and S. Barnhart. 2009. Incentives and Barriers to Implementing National Hospital Standards in Uganda. *International Journal of Quality Health Care* 21(6):421–26.

Beaglehole, R., and M.R. Dal Poz. 2003. Public Health Workforce: Challenges and Policy Issues. Editorial. *Human Resources for Health* 1(1):4.

Bhutta, Z.A., S. Ali, S. Cousens, T.M. Ali, B.A. Haider, A. Rizvi, P. Okong, S.Z. Bhutta, and R.E. Black. 2008. Alma-Ata: Rebirth and Revision 6—Interventions to Address Maternal, Newborn, and Child Survival: What Difference Can Integrated Primary Health Care Strategies Make? *The Lancet* 372(9642):972–89.

Bossert, T.J., and T. Ono. 2010. Finding Affordable Health Workforce Targets in Low-income Nations. *Health Affairs* 29(7):1376–82.

Brownbridge, M. 2004. Financing the Millennium Development Goals: Is More Public Spending the Best Way to Meet Poverty Reduction Targets? *Health Policy and Development* (1):40–47.

Buchan, J., B. McPake, K. Mensah, and G. Rae. 2009. Does a Code Make a Difference? Assessing the English Code of Practice on International Recruitment. *Human Resources for Health* 7:33.

Campbell, J., I. Jones, and D. Whyms. 2011. More Money for Health—More Health for the Money: A Human Resources for Health Perspective. *Human Resources for Health* 9:18. doi: 10.1186/1478-4491-9-18.

CGI (Clinton Global Initiative). 2012. About Us. Available at http://www.clintonglobalinitiative.org/aboutus/.

CHAI (Clinton Health Access Initiative). 2012. About CHAI. Available at http://www.clintonhealthaccess.org/about.

Cohen R.L., Y. Li, R. Giese, and J.D. Mancuso. 2012. An Evaluation of PEPFAR's Effect on Health Systems Strengthening in Sub-Saharan Africa. *Journal of Acquired Immune Deficiency Syndrome*, Dec 18. Abstract available at http://www.ncbi.nlm.nih.gov/pubmed/23254150.

de Savigny, D., and T. Adam, eds. 2009. *Systems Thinking for Health Systems Strengthening*. Geneva: World Health Organization. Available at http://www.who.int/alliance-hpsr/resources/9789241563895/en/index.html.

Dovlo, D. 2004. Using Mid-Level Cadres as Substitutes for Internationally Mobile Health Professionals in Africa: A Desk Review. *Human Resources for Health* 2(1):7.

Dumont, J., and P. Zurn. 2010. *OECD Policy Brief on the International Migration of Health Workforce*. Paris: Organisation for Economic Co-operation and Development.

Estabrooks, C.A., W.K. Midodzi, G.G. Cummings, K.L. Ricker, and P. Giovannetti. 2005. The Impact of Hospital Nursing Characteristics on 30-Day Mortality. *Nursing Research* 54(2):74–84.

FHWC (Frontline Health Workers Coalition). 2012a. *Frontline Health Workers: The Best Way to Save Lives, Accelerate Progress on Global Health, and Help Advance U.S. Interests*, Issue Brief, January. Available at http://frontlinehealthworkers.org/resources/resources/.

FHWC (Frontline Health Workers Coalition). 2012b. Our Members. Available at http://frontlinehealthworkers.org/about-the-coalition/our-members.

Frenk, J. 2010. The Global Health System: Strengthening National Health Systems as the Next Step for Global Progress. *PLoS Med* 7(1):e1000089. doi:10.1371/journal.pmed.1000089.

Frenk, J., L. Chen, Z.A. Bhutta, J. Cohen, N. Crisp, T. Evans, H. Fineberg, P. Garcia, Y. Ke, P. Kelly, B. Kistnasamy, A. Meleis, D. Naylor, A. Pablos-Mendez, S. Reddy, S. Scrimshaw, J. Sepulveda, D. Serwadda, and H. Zurayk. 2010. Health Professionals for a New Century: Transforming Education to Strengthen Health Systems in an Interdependent World. *The Lancet* 376(9756):1923–58.

Fulton, B.D., R.M. Scheffler, S.P. Sparkes, E.Y. Auh, M. Vujicic, and A. Soucat. 2011. Health Workforce Skill Mix and Task Shifting in Low Income Countries: A Review of Recent Evidence. *Human Resources for Health* 9(1):1.

G8. 2008. *Toyako Framework for Action on Global Health: Report of the G8 Health Experts Group*. Hokkaido Toyako Summit, July 7–9, 2008. Available at http://www.g8.utoronto.ca/summit/2008hokkaido/index.html.

G8. 2011. *Deauville Accountability Report: G8 Commitments on Health and Food Security: State of Delivery and Results*. Available at http://www.g8.utoronto.ca/summit/2011deauville/accountability.html.

Garg, C.C., D. Evans, T. Dmytraczenko, J.A. Izazola-Licea, V. Tangcharoensathien, and T. Tan-Torres Ejeder. 2012. Study Raises Questions about Measurement of Additionality or Maintaining Domestic Health Spending Amid Foreign Donations. *Health Affairs* 31(2):417–25.

GHWA (Global Health Workforce Alliance). 2008a. *Scaling Up, Saving Lives*. Geneva: Global Health Workforce Alliance. Available at http://www.who.int/workforcealliance/knowledge/resources/scalingup/en/index.html.

GHWA (Global Health Workforce Alliance). 2008b. *The Kampala Declaration and Agenda for Global Action*. Geneva: Global Health Workforce Alliance. Available at http://www.who.int/workforcealliance/Kampala%20Declaration%20and%20Agenda%20web%20file.%20FINAL.pdf.

GHWA (Global Health Workforce Alliance). 2010a. *Annual Report 2010: Adding Value to Health*. Geneva: Global Health Workforce Alliance. Available at http://www.who.int/workforcealliance/knowledge/resources/annualreport2010/en/.

GHWA (Global Health Workforce Alliance). 2010b. *Human Resources for Health—Country Coordination and Facilitation (CCF): Principles and Process*. Geneva: Global Health Workforce Alliance. Available at http://www.who.int/workforcealliance/knowledge/resources/CCF_Principles_Processes_web.pdf.

GHWA (Global Health Workforce Alliance). 2010c. *First Consultation of the African Platform on Human Resources for Health*. Geneva: Global Health Workforce Alliance. Available at http://www.who.int/workforcealliance/media/events/2010/africanplatformcons/en/.

GHWA (Global Health Workforce Alliance). 2010d. *Global Experience of Community Health Workers for Delivery of Health Related Millennium Development Goals: A Systematic Review, Country Case Studies, and Recommendations for Integration into National Health Systems*. Geneva: Global Health Workforce Alliance. Available at http://www.who.int/workforcealliance/knowledge/resources/chwreport/en/index.html.

GHWA (Global Health Workforce Alliance). 2011a. *From Kampala to Bangkok: Reviewing Progress, Renewing Commitments*. Outcome Statement of the Second Global Forum on Human Resources for Health, Bangkok, January 27–29. Available at http://www.who.int/workforcealliance/forum/2011/Outcomestatement.pdf.

GHWA (Global Health Workforce Alliance). 2011b. *Partnering for Progress: Country Coordination Boosts Human Resources for Health*. Geneva: Global Health Workforce Alliance. Available at http://www.who.int/workforcealliance/knowledge/resources/CCF-MeetingReport.pdf.

GHWA (Global Health Workforce Alliance). 2011c. *Reviewing Progress, Renewing Commitments: Progress Report on the Kampala Declaration and Agenda for Global Action*. Geneva: Global Health Workforce Alliance. Available at http://www.who.int/workforcealliance/knowledge/resources/KDAGAprogressreport_2011.pdf.

GHWA (Global Health Workforce Alliance). 2012a. Country HRH Web Profiles. Available at http://www.who.int/workforcealliance/countries/en/.

GHWA (Global Health Workforce Alliance). 2012b. *Health Workforce Innovation: Accelerating Private Sector Responses to the Human Resources for Health Crisis*. Private Sector Task Force Report Global Health Workforce Alliance. Geneva: Global Health Workforce Alliance. Available at http://www.who.int/workforcealliance/knowledge/resources/privatesectorhrh_report/en/index.html.

GHWA (Global Health Workforce Alliance). 2012c. *Skills Mix to Achieve Universal Health Coverage: A Global Systematic Review and Country Case Studies on Roles and Impact of Mid-Level Health Workers*. Global Health Workforce Alliance Media Centre. Geneva: Global Health Workforce Alliance. Available at http://www.who.int/workforcealliance/media/news/2012/beijingsymposiumhrhstory/en/index.html.

GHWA (Global Health Workforce Alliance). 2012d. *The Global Health Workforce Alliance Strategy, 2013–2016: Advancing the Health Workforce Agenda within Universal Coverage*. Geneva: Global Health Workforce Alliance. Available at http://www.who.int/workforcealliance/knowledge/resources/ghwastrat20132016/en/index.html.

Gostin, L.O., M. Heywood, G. Ooms, A. Grover, J.A. Rottingen, and W. Chenguang. 2010. National and Global Responsibilities for Health. Editorial. *Bulletin of the World Health Organization* 88(10):719.

Hagopian, A., A. Ofosu, A. Fatusi, R. Biritwum, A. Essel, L. Gary Hart, and C. Watts. 2005. The Flight of Physicians from West Africa: Views of African Physicians and Implications for Policy. *Social Science & Medicine* 61(8):1750–60.

Hagopian, A., M.J. Thompson, M. Fordyce, K.E. Johnson, and L.G. Hart. 2004. The Migration of Physicians from Sub-Saharan Africa to the United States of America: Measures of the African Brain Drain. *Human Resources for Health* 2(1):17.

Hagopian, A., M.J. Thompson, E. Kaltenbach, and L.G. Hart. 2003. Health Departments' Use of International Medical Graduates in Physician Shortage Areas. *Health Affairs* 22(5):241–49.

Hagopian, A., M.J. Thompson, E. Kaltenbach, and L.G. Hart. 2004. The Role of International Medical Graduates in America's Small Rural Critical Access Hospitals. *The Journal of Rural Health* 20(1):52–8.

Hagopian, A., A. Zuyderduin, N. Kyobutungi, and F. Yumkella. 2009. Job Satisfaction and Morale in the Ugandan Health Workforce. *Health Affairs* 28(5):w863–75.

Hart, L.G., S.M. Skillman, M. Fordyce, M. Thompson, A. Hagopian, and T.R. Konrad. 2007. International Medical Graduate Physicians in the United States: Changes Since 1981. *Health Affairs* 26(4):1159–69.

Hermann K., W. Van Damme, G.W. Pariyo, E. Schouten, Y. Assefa, A. Cirera, and W. Massavon. 2009. Community Health Workers for ART in Sub-Saharan Africa: Learning from Experience—Capitalizing on New Opportunities. *Human Resources for Health* 7:31.

Hill, P.S., P. Vermeiren, K. Miti, G. Ooms, and W. Van Damme. 2011. The Health Systems Funding Platform: Is This Where We Thought We Were Going? *Globalization and Health* 7:16.

Hongoro, C., and C. Norman. 2006. Health Workers: Building and Motivating the Workforce. In *Disease Control Priorities in Developing Countries*, eds. D.T. Jamison, J.G. Breman, A.R. Measham, G. Alleyne, M. Claeson, and D.B. Evans, 1309–22. New York and Washington, DC: Oxford University Press and The World Bank.

Horton, R. 2009. What Will It Take to Stop Maternal Deaths? Comment. *The Lancet* 374(9699):1400–1402.

HSSE (Health Systems Strengthening for Equity). 2013. *Health Systems Strengthening for Equity: The Power and Potential of Mid-Level Providers*. Available at http://www.midlevelproviders.org/.

ICN (International Council of Nurses). 2008. *Nursing Care Continuum: Framework and Competencies*. Geneva: International Council of Nurses.

IHME (Institute for Health Metrics and Evaluation). 2010. *Financing Global Health 2010: Development Assistance and Country Spending in Economic Uncertainty*. Seattle: Institute for Health Metrics and Evaluation. Available at http://www.healthmetricsandevaluation.org/publications/policy-report/financing_global_health_2010_IHME#/data-methods.

ILO (International Labour Organization). 2008. *World of Work Report 2008: Income Inequalities in the Age of Financial Globalization*. International Institute for Labour Studies. Geneva: International Labour Office.

ILO (International Labour Organization). 2010. *World Social Security: Providing Coverage in Times of Crisis and Beyond, 2010–2011*. Geneva: International Labour Office. Available at http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_146566.pdf.

IOM (Institute of Medicine). 2004. *Keeping Patients Safe: Transforming the Work Environment of Nurses*. Washington, DC: The National Academies Press.

IOM (Institute of Medicine). 2009. *The U.S. Commitment to Global Health: Recommendations for the Public and Private Sectors*. Washington, DC: The National Academies Press. Available at http://www.iom.edu/Reports/2009/The-US-Commitment-to-Global-Health-Recommendations-for-the-Public-and-Private-Sectors.aspx.

IOM (Institute of Medicine). 2010. *The Future of Nursing: Leading Change, Advancing Health*. Washington, DC: The National Academies Press.

IRIN. 2011. *Analysis: Plugging the Health Worker Brain Drain*. Available at http://www.irinnews.org/report.aspx?reportid=92949.

JCAHO (Joint Commission on Accreditation of Healthcare Organizations). 2002. *Health Care at the Crossroads: Strategies for Addressing the Evolving Nursing Crisis*. Oakbrook Terrace, IL: Joint Commission on Accreditation of Healthcare Organizations. Available at http://www.jointcommission.org/assets/1/18/health_care_at_the_crossroads.pdf.

JLI (Joint Learning Initiative). 2004. *Human Resources for Health: Overcoming the Crisis*. Cambridge: Global Equity Initiative, Harvard University. Available at http://www.who.int/hrh/documents/JLi_hrh_report.pdf.

Kahn, T.R., A. Hagopian, and K. Johnson. 2010. Retention of J-1 Visa Waiver Program Physicians in Washington State's Health Professional Shortage Areas. *Academic Medicine* 85(4):614–21.

Kates, J., A. Wexler, and A. Valentine. 2011. *Donor Funding for Health in Low- & Middle-Income Countries, 2002–2009*. Washington, DC: Kaiser Family Foundation.

Ketefian, S. 2008. Doctoral Education in the Context of International Development Strategies. Editorial. *International Journal of Nursing Studies* 45(10):1401–2.

Ketefian, S., P. Davidson, J. Daly, E. Chang, and W. Srisuphan. 2005. Issues and Challenges in International Doctoral Education in Nursing. *Nursing & Health Science* 7(3):150–56.

Lancet. 2008. Finding Solutions to the Human Resources for Health Crisis. Editorial. *The Lancet* 371(9613):623.

Laurant, M., M. Harmsen, H. Wollersheim, R. Grol, M. Faber, and B. Sibbald. 2009. The Impact of Nonphysician Clinicians: Do They Improve the Quality and Cost-Effectiveness of Health Care Services? *Medical Care Research and Review* 66(6 Suppl):36S–89S.

Laurant, M., D. Reeves, R. Hermens, J. Braspenning, R. Grol, and B. Sibbald 2005. Substitution of Doctors by Nurses in Primary Care. *Cochrane Database Systematic Review* April 18(2): CDOO1271.

Lawrence, S. 2012. *Foundation Growth and Giving Estimates*. New York: Foundation Center. Available at http://foundationcenter.org/gainknowledge/research/pdf/fgge12.pdf.

Lewin, S., S. Munabi-Babigumira, C. Glenton, K. Daniels, X. Bosch-Capblanch, B.E. van Wyk , J. Odgaard-Jensen, M. Johansen, G.N. Aja, M. Zwarenstein, and I.B. Scheel. 2010. Lay Health Workers in Primary and Community Health Care for Maternal and Child Health and the Management of Infectious Diseases. *Cochrane Database Systematic Review* no. 3:CD004015. doi: 10.1002/14651858.CD004015.pub3.

Lucas, H. 2008. Information and Communications Technology for Future Health Systems in Developing Countries. Review. *Social Science & Medicine* 66(10):2122–32.

McAuliffe, E., C. Bowie, O. Manafa, F. Maseko, M. MacLachlan, D. Hevey, C. Normand, and M. Chirwa. 2009. Measuring and Managing the Work Environment of the Mid-Level Provider—the Neglected Human Resource. *Human Resources for Health* 7:13.

McAuliffe, E., O. Manafa, F. Maseko, C. Bowie, and E. White. 2009. Understanding Job Satisfaction amongst Mid-Level Cadres in Malawi: The Contribution of Organisational Justice. *Reproductive Health Matters* 17(33):80–90.

McCoy, D., M. Chopra, R. Loewenson, J.M. Aitken, T. Ngulube, A. Muula, S. Ray, T. Kureyi, P. Ijumba, and T. Rowson. 2005. Expanding Access to Antiretroviral Therapy in Sub-Saharan Africa: Avoiding the Pitfalls and Dangers, Capitalizing on the Opportunities. *American Journal of Public Health* 95(1):18–22.

Merlin. 2013. Hands Up for Health Workers campaign. Available at http://www.handsupforhealthworkers.org/home.php?q=2.

Middleberg, M.I. 2010. *Saving Lives, Ensuring a Legacy: A Health Workforce Strategy for the Global Health Initiative*. Global Health Workforce Policy Papers No. 1. Chapel Hill, NC: IntraHealth International. Available at http://www.intrahealth.org/files/media/saving-lives-ensuring-a-legacy-a-health-workforce-strategy-for-the-global-health-initiative/IntraHealth_Policy_Paper_1.pdf.

Mills, E.J., S. Kanters, A. Hagopian, N. Bansback, J. Nachega, M. Alberton, C.G. Au-Yeung, A. Mtambo, I.L. Bourgeault, S. Luboga, R.S. Hogg, and N. Ford. 2011. The Financial Cost of Doctors Emigrating from Sub-Saharan Africa: Human Capital Analysis. *British Medical Journal* 343:d7031.

Mills, E.J., W.A. Schabas, J. Volmink, R. Walker, N. Ford, E. Katabira, A. Anema, M. Joffres, P. Cahn, and J. Montaner. 2008. Should Active Recruitment of Health Workers from Sub-Saharan Africa Be Viewed as a Crime? *The Lancet* 371(9613):685–88.

MSH (Management Sciences for Health). 2010. *A Guide to Develop and Implement Strategies to Achieve an Effective and Sustainable Health Workforce*. Available at http://www.msh.org/news-bureau/upload/HRM-Health-Action-Framework_7-28-10_web.pdf.

Mullan, F. 2002. Some Thoughts on the White-Follows-Green Law. *Health Affairs* 21(1):158–59.

Mullan, F., and S. Frehywot. 2007. Non-Physician Clinicians in 47 Sub-Saharan African Countries. *The Lancet* 370(9605):2158–63.

Mullan, F., S. Frehywot, and L.J. Jolley. 2008. Aging, Primary Care, and Self-Sufficiency: Health Care Workforce Challenges Ahead. *The Journal of Law, Medicine & Ethics* 36(4):703–8, 608.

Mullan, F., S. Frehywot, F. Omaswa, E. Buch, C. Chen, S.R. Greysen, T. Wassermann, D.E. Abubakr, M. Awases, C. Boelen, M.J. Diomande, D. Dovlo, J. Ferro, A. Haileamlak, J. Iputo, M. Jacobs, A.K. Koumaré, M. Mipando, G.L. Monekosso, E.O. Olapade-Olaopa, P. Rugarabamu, N.K. Sewankambo, H. Ross, H. Ayas, S.B. Chale, S. Cyprien, J. Cohen, T. Haile-Mariam, E. Hamburger, L. Jolley, J.C. Kolars, G. Kombe, and A.J. Neusy. 2011. Medical Schools in Sub-Saharan Africa. *The Lancet* 377(9771):1113–21.

Murray, C.J., B. Anderson, R. Burnstein, K. Leach-Kemon, M. Schneider, A. Tardiff, and R. Zhang. 2011. Development Assistance for Health: Trends and Prospects. *The Lancet* 378(9785):8–10.

Needleman, J., and P. Buerhaus. 2003. Nurse Staffing and Patient Safety: Current Knowledge and Implications for Action. *International Journal of Quality Health Care* 15(4):275–77.

Needleman, J., P. Buerhaus, S. Mattke, M. Stewart, and K. Zelevinsky. 2002. Nurse-Staffing Levels and the Quality of Care in Hospitals. *New England Journal of Medicine* 346(22):1715–22.

Needleman, J., P.I. Buerhaus, M. Stewart, K. Zelevinsky, and S. Mattke. 2006. Nurse Staffing in Hospitals: Is There a Business Case for Quality? *Health Affairs* 25(1):204–11.

Nguyen, L., S. Ropers, E. Nderitu, A. Zuyderduin, S. Luboga, and A. Hagopian. 2008. Intent to Migrate among Nursing Students in Uganda: Measures of the Brain Drain in the Next Generation of Health Professionals. *Human Resources for Health* 6:5.

NYAM and JCNE (New York Academy of Medicine and Jonas Center for Nursing Excellence). 2006. *Nurse Retention and Workforce Diversity: Two Key Issues in New York City's Nursing Crisis*. New York: The New York Academy of Medicine and The Jonas Center for Nursing Excellence. Available at http://www.nyam.org/news/docs/Nurse_retention_and_workforce_diversity_in_nyc_2006.pdf.

Nyamtema, A.S. 2010. Bridging the Gaps in the Health Management Information System in the Context of a Changing Health Sector. *BMC Medical Informatics and Decision Making* 10:36.

Odaga, J., and P. Lochoro. 2006. *Budget Ceilings and Health in Uganda*, ed. Wemos Foundation. The Netherlands: Wemos Foundation.

OECD, WP-EFF, and TT HATS (Organization for Economic Co-operation and Development, Working Party on Aid Effectiveness, and Task Team on Health as a Trace Sector). 2011. *Progress and Challenges in Aid Effectiveness: What Can We Learn from the Health Sector?* Paris: Organisation for Economic Co-operation and Development. Available at http://www.oecd.org/development/effectiveness/48298309.pdf.

Omaswa, F., and J.I. Boufford. 2010. *Strong Ministries for Strong Health Systems: An Overview of the Study Report: Supporting Ministerial Health Leadership: A Strategy for Health Systems Strengthening*. New York: The Rockefeller Foundation.

Oxman, A.D., and A. Fretheim. 2009. Can Paying for Results Help to Achieve the Millennium Development Goals? A Critical Review of Selected Evaluations of Results-Based Financing. *Journal of Evidence-Based Medicine* 2(3):184–95.

Ozgediz, D., M. Galukande, J. Mabweijano, S. Kijjambu, C. Mijumbi, G. Dubowitz, S. Kaggwa, and S. Luboga. 2008. The Neglect of the Global Surgical Workforce: Experience and Evidence from Uganda. *World Journal of Surgery* 32(6):1208–15.

Perrin, M.E., A. Hagopian, A. Sales, and B. Huang. 2007. Nurse Migration and Its Implications for Philippine Hospitals. *International Nursing Review* 54(3):219–26.

Perry, H., and R. Zulliger. 2012. *How Effective Are Community Health Workers? An Overview of Current Evidence with Recommendations for Strengthening Community Health Worker Programs to Accelerate Progress in Achieving the Health-Related Millennium Development Goals*. Baltimore: Johns Hopkins Bloomberg School of Public Health.

Petrakova, A., and R. Sadana. 2007. Problems and Progress in Public Health Education. *Bulletin of the World Health Organization* 85(12):963–65; discussion 966–70.

Pfeiffer, J., W. Johnson, M. Fort, A. Shakow, A. Hagopian, S. Gloyd, and K. Gimbel-Sherr. 2008. Strengthening Health Systems in Poor Countries: A Code of Conduct for Nongovernmental Organizations. Review. *American Journal of Public Health* 98(12):2134–40.

Recife FWG (Forum Working Group). 2012. Third Global Forum on Human Resources for Health Strategic Plan. November 22. Geneva: Recife Forum Working Group/Global Health Workforce Alliance.

Reich, M.R., and K. Takemi. 2009. G8 and Strengthening of Health Systems: Follow-up to the Toyako Summit. *The Lancet* 373(9662):508–15.

Reid, U., and B. Weller. 2010. *Nursing Human Resources Planning and Management Competencies*. Geneva: International Council of Nurses. Available at http://www.hrhresourcecenter.org/node/3399.

Rothberg, M.B., I. Abraham, P.K. Lindenauer, and D.N. Rose. 2005. Improving Nurse-to-Patient Staffing Ratios as a Cost-Effective Safety Intervention. *Medical Care* 43(8):785–91.

Rwanda MOH (Ministry of Health). 2012. HRH Program. Available at http://hrhconsortium.moh.gov.rw/about/approach/.

Salaam-Blyther, T. 2010. *The Global Fund to Fight AIDS, Tuberculosis, and Malaria: U.S. Contributions and Issues for Congress*. Congressional Research Service. Available at http://fpc.state.gov/documents/organization/147258.pdf.

Save the Children. 2011a. Every Beat Matters campaign. Available at http://www.everybeatmatters.org/.

Save the Children. 2011b. Health Workers Count campaign. Available at http://www.healthworkerscount.org/about/.

Scheffler, R.M., C.B. Mahoney, B.D. Fulton, M.R. Dal Poz, and A.S. Preker. 2009. Estimates of Health Care Professional Shortages in Sub-Saharan Africa by 2015. *Health Affairs* 28(5):w849–62.

Sekhri, N., R. Feachem, and A. Ni. 2011. Public-Private Integrated Partnerships Demonstrate the Potential to Improve Health Care Access, Quality, and Efficiency. *Health Affairs* 30(8):1498–507.

Sibley, L., and T. Sipe. 2004. What Can a Meta-Analysis Tell Us about Traditional Birth Attendant Training and Pregnancy Outcomes? *Midwifery* 20(1):51–60.

Soeters, R., and P. Vroeg. 2011. Why There Is So Much Enthusiasm for Performance-Based Financing, Particularly in Developing Countries. *Bulletin of the World Health Organization* 89(9):700.

Spero, J.E. 2010. *The Global Role of U.S. Foundations*. New York: The Foundation Center. Available at http://foundationcenter.org/gainknowledge/research/pdf/global_role_of_us_foundations.pdf.

Spero, J.C., P.A. McQuide, and R. Matte. 2011. Tracking and Monitoring the Health Workforce: A New Human Resources Information System (HRIS) in Uganda. *Human Resources for Health* 9:6.

Speybroeck, N., Y. Kinfu, M.R. Dal Poz, and D.B. Evans. 2006. *Reassessing the Relationship between Human Resources for Health, Intervention Coverage and Health Outcomes*. Background Paper for The World Health Report 2006. Geneva: World Health Organization. Available at www.who.int/hrh/documents/reassessing_relationship.pdf.

Stilwell, B. 2011. Will They Stay or Will They Go? Putting Theory into Practice to Guide Effective Workforce Retention Mechanisms. *World Health & Population* 13(2):34–40.

The Global Fund. 2011. *The Global Fund Information Note: The Global Fund's Approach to HSS*. Available at http://www.theglobalfund.org/en/performance/effectiveness/hss/.

Tourangeau, A.E., and L.A. Cranley. 2006. Nurse Intention to Remain Employed: Understanding and Strengthening Determinants. *Journal of Advanced Nursing* 55(4):497–509.

UK DOH (United Kingdom Department of Health). 2004. *Code of Practice for the International Recruitment of Healthcare Professionals*. Leeds, UK: Department of Health. Available at http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4097734.pdf.

UN (United Nations). 2000. *Millenium Summit Resolution*. New York: UN General Assembly.

UN (United Nations). 2011. *The Millennium Development Goals Report 2011*. New York: UN General Assembly. Available at http://www.un.org/millenniumgoals/pdf/(2011_E)%20MDG%20Report%202011_Book%20LR.pdf.

UN (United Nations). 2012. UN Sixty-seventh General Assembly: Adopting Consensus Text, General Assembly Encourages Member States to Plan, Pursue Transition of National Health Care Systems toward Universal Coverage, December 12. Available at http://www.un.org/News/Press/docs/2012/ga11326.doc.htm.

UN-IGME (United Nations Inter-agency Group for Child Mortality Estimation). 2012. *Levels and Trends in Child Mortality, 2012 Report*. New York: United Nations Children's Fund. Available at http://www.childmortality.org/files_v10/download/Levels%20and%20Trends%20in%20Child%20Mortality%20Report%202012.pdf.

US GHI (United States Global Health Initiative). 2012. Global Health Initiative. Available at http://www.ghi.gov.

US OGAC (Office of the US Global AIDS Coordinator). 2005. *The President's Emergency Plan for AIDS Relief: First Annual Report to Congress*. Washington, DC: Office of the US Global AIDS Coordinator. Available at http://www.state.gov/s/gac/rl/43811.htm.

Vujicic, M., K. Ohiri, and S. Sparkes. 2009. *Working in Health: Financing and Managing the Public Sector Health Workforce*. Washington, DC: The World Bank. Available at http://publications.worldbank.org/index.php?main_page=product_info&cPath=0&products_id=23062.

Vujicic, M., S.E. Weber, I.A. Nikolic, R. Atun, and R. Kumar. 2012. An Analysis of GAVI, the Global Fund, and World Bank Support for Human Resources for Health in Developing Countries. *Health Policy and Planning* 27(8):649–57.

WHO (World Health Organization). 2000. *The World Health Report 2000: Health Systems: Improving Performance*. Geneva: World Health Organization. Available at http://www.who.int/whr/2000/en/whr00_en.pdf.

WHO (World Health Organization). 2003. *The Abuja Declaration and the Plan of Action: An Extract from the African Summit on Roll Back Malaria*. Abuja, April 25, 2000. Geneva: World Health Organization. Available at http://www.rollbackmalaria.org/docs/abuja_declaration.pdf.

WHO (World Health Organization). 2006a. *Fifty-ninth World Health Assembly: Rapid Scaling Up of a Health Workforce Production*. World Health Assembly Resolution WHA59:23. Geneva: World Health Organization.

WHO (World Health Organization). 2006b. *The World Health Report 2006: Working Together for Health*. Geneva: World Health Organization. Available at http://www.who.int/whr/2006/whr06_en.pdf.

WHO (World Health Organization). 2007. *Everybody's Business: Strengthening Health Systems to Improve Health Outcomes: WHO's Framework for Action*. Geneva: World Health Organization. Available at http://www.who.int/healthsystems/strategy/everybodys_business.pdf.

WHO (World Health Organization). 2008a. *Task Shifting: Global Recommendations and Guidelines*. Geneva: World Health Organization. Available at http://www.who.int/healthsystems/TTR-TaskShifting.pdf.

WHO (World Health Organization). 2008b. *The World Health Report 2008: Primary Health Care: Now More than Ever*. Geneva: World Health Organization. Available at http://www.who.int/whr/2008/en/index.html.

WHO (World Health Organization). 2010a. *Global Status Report on Non-Communicable Diseases 2010*. Geneva: World Health Organization.

WHO (World Health Organization). 2010b. *Increasing Access to Health Workers in Remote and Rural Areas through Improved Retention: Global Policy Recommendations*. Geneva: World Health Organization. Available at http://whqlibdoc.who.int/publications/2010/9789241564014_eng.pdf.

WHO (World Health Organization). 2010c. *The WHO Global Code of Practice on the International Recruitment of Health Personnel*. Geneva: World Health Organization. Available at http://www.who.int/hrh/migration/code/code_en.pdf.

WHO (World Health Organization). 2010d. *The World Health Report: Health Systems Financing: The Path to Universal Coverage*. Geneva: World Health Organization. Available at http://whqlibdoc.who.int/whr/2010/9789241564021_eng.pdf.

WHO (World Health Organization). 2010e. *Trends in Maternal Mortality: 1990–2008*. Geneva: World Health Organization.

WHO (World Health Organization). 2011a. *Global Atlas of the Health Workforce*. Geneva: World Health Organization. Available at http://apps.who.int/globalatlas/default.asp.

WHO (World Health Organization). 2011b. *The Abuja Declaration: Ten Years On*. Geneva: World Health Organization. Available at http://www.who.int/healthsystems/publications/abuja_report_aug_2011.pdf.

WHO (World Health Organization). 2011c. *Transformative Scale-Up of Health Professional Education: An Effort to Increase the Numbers of Health Professionals*. Geneva: World Health Organization.

WHO (World Health Organization). 2012a. *Building a Future for Women and Children: The 2012 Report*. Countdown to 2015 Initiative. Geneva: World Health Organization.

WHO (World Health Organization). 2012b. *Optimizing Health Worker Roles to Improve Access to Key Maternal and Newborn Health Interventions through Task Shifting*. Geneva: World Health Organization. Available at http://apps.who.int/iris/bitstream/10665/77764/1/9789241504843_eng.pdf.

WHO (World Health Organization). 2012c. *World Health Statistics 2012*. Geneva: World Health Organization. Available at http://www.who.int/gho/publications/world_health_statistics/EN_WHS2012_Full.pdf.

WHO (World Health Organization). 2013a. Global Health Observatory Data Repository. Available at http://apps.who.int/gho/data/?vid=1901.

WHO (World Health Organization). 2013b. WHO Organigram. Available at http://www.who.int/about/structure/organigram/en/index.html.

Willis-Shattuck, M., P. Bidwell, S. Thomas, L. Wyness, D. Blaauw, and P. Ditlopo. 2008. Motivation and Retention of Health Workers in Developing Countries: A Systematic Review. *BMC Health Services Research* 8:247.

Witter, S., G. Cometto, R.U. Zaman, M.R. Sheikh, and S. Wibulpolprasert. 2013. Implementing the Agenda for Global Action on Human Resources for Health: Analysis from an International Tracking Survey. *Journal of Hospital Administration* 2(1):77–87. Available at http://www.sciedu.ca/journal/index.php/jha/article/view/1843.

Xu, Y., and J. Zhang. 2005. One Size Doesn’t Fit All: Ethics of International Nurse Recruitment from the Conceptual Framework of Stakeholder Interests. *Nursing Ethics* 12(6):571–81.

Zurn, P., L. Codjia, F.L. Sall, and J.M. Braichet. 2010. How to Recruit and Retain Health Workers in Underserved Areas: The Senegalese Experience. *Bulletin of the World Health Organization* 88(5):386–89.

Zurn, P., M.R. Dal Poz, B. Stilwell, and O. Adams. 2004. Imbalance in the Health Workforce. *Human Resources for Health* 2(1):13.

APPENDIX 1.
EXAMPLES OF FOUNDATION INVESTMENTS IN GLOBAL HEALTH WORKFORCE

Accordia Global Health Foundation*	2001	Partners with academic medical centers in Africa to develop leadership in training, research, and clinical services to build Africa's capacity to address infectious diseases of HIV, malaria, and tuberculosis
	2004	Establishes a Regional Center of Excellence to promote best practices in sub-Saharan Africa, the Infectious Diseases Institute (IDI) at Makerere University in Kampala. Develops training programs with innovative design and delivery elements that focus on building long-lasting capacity among the health care workforce.
	2005	With a grant from ExxonMobil's Africa Health Initiative, launches the Joint Uganda Malaria Training Program (JUMP) with IDI at Makerere University, in partnership with Uganda Malaria Surveillance Project, UCSF, and others. The program's aim is to build capacity among African health care workers in malaria prevention, diagnosis, and treatment.
	2008	With a $12.5 million grant from the Bill & Melinda Gates Foundation, leads a three-year Integrated Infectious Disease Capacity-Building Evaluation (IDCAP). In partnership with the MOH and others, IDCAP aims to identify the best and most cost-effective approach to training midlevel health care providers on infectious disease prevention, care, and treatment at thirty-six sites in Uganda.
Aga Khan Foundation	1980s	Contributes to establishing nursing schools in Pakistan, Kenya, Uganda, and Tanzania.

	2010	Initiates the following HRH projects: 1. AKU Advanced Nursing Studies Program, East Africa 2. Nursing Program, Egypt 3. Community Health Program, India, Kyrgyz Republic, Mali, Syria, Tajikistan 4. Coastal Rural Support Program Health System Strengthening, Mozambique
Atlantic Philanthropies*	1998–	Vietnam: Through partnerships with national government and collaborations with provincial governments and local communities, aims to improve primary health care service delivery in regions with the most disadvantaged populations; strives to enhance the primary health care system and to build capacity of select institutions in public health, including public health training institutions and rural community-based training centers; establishes models of community-based comprehensive primary health care systems, scaling up proven models.
	2000–	Supports social justice approach to health care and health professional training in Cuba.
	2007	Global Health Education Consortium (GHEC) works to identify innovative schools of medicine and health sciences addressing the health and social needs of underserved and marginalized populations. GHEC leads to Training for Health Equity Network (THEnet).
	2009–2012	South Africa: Focuses on training health care professionals. Massive grants (R70 million over four years) support nursing education to address the shortage.
BRAC	1978	Establishes first Training and Resource Centre (TARC). As of 2013, there are twenty-two TARCs throughout Bangladesh and two BRAC Centers for Development Management (BCDM).

Carnegie Corporation	1940–1950s	Grants program focused on higher education in Africa.
	1960	Releases Ashby Commission Report, *Investment in Education*.
	1969	Establishes Association for Teacher Education in Africa (ATEA), focused on linking African and American universities.
	1988–1993	Awards more than 90 grants (~$11 million) to reduce maternal mortality through the Strengthening Human Resources in Developing Countries program. Is involved in training more than 800 nurses, midwives, and university medical students to become master trainers capable of training others.
	2000	Provides support to allay physician migration and brain drain from African countries.
	2000–2010	Forms Partnership for Higher Education in Africa (PHEA), a ten-year initiative with contributions from seven foundations (estimated grants $440 million).
Clinton Health Access Initiative*	2005	In partnership with the Kenyan government, addresses ways to utilize unemployed nurses.
	2006	In partnership with Lesotho's government, addresses nurse shortage and task shifting.
		In partnership with Ethiopia's government, aims to improve hospital management.
	2007	In partnership with the Zambian government, focuses on expanding capacity and improving the quality of the national health workforce. Targeted interventions include the scale-up of pre-service training programs that aim to dramatically expand the number of qualified workers entering the health workforce.

	2008	In partnership with the Malawi government, invests in lab service training and task shifting.
		In partnership with the Nigerian government, launches a peer model to enhance counseling and testing.
Doris Duke Charitable Foundation	2009	Grants the African Health Initiative ~$44 million over five to seven years to support four research partnerships to design and implement large-scale primary health care programs in sub-Saharan Africa.
Ford Foundation	1950s–1960s	Awards grants that help develop demography as an independent discipline. Funds numerous demography centers in universities, especially in developing countries.
	2000–2010	Joins Partnership for Higher Education in Africa (PHEA).
Bill & Melinda Gates Foundation	2004	Contributes to Rockefeller-led Joint Learning Initiative report.
	2011	In partnership with the David and Lucile Packard Foundation, funds a fellowship program for midlevel public health officials from low-income countries.
	2008–2012	Supports the Ministerial Leadership Initiative for Global Health (MLI), a practice-based model of leadership development of the Aspen Institute to strengthen capacity with Ministries of Health in five countries: Ethiopia, Mali, Nepal, Senegal, and Sierra Leone.
		Funds Bihar India Project (US$80 million), a five-year project launched in partnership with the state government and NGOs to improve health outcomes for mothers, newborns, and children.

William and Flora Hewlett Foundation	2005–2010	Joins Partnership for Higher Education in Africa (PHEA).
	2008	Along with Open Society Institute, supports Open Educational Resources (OER) to advance the quality and capacity of health education in Africa, developing materials that are freely available for use, reuse, adaptation, and sharing.
	2009	Supports the African Health OER Network, which is composed of University of Ghana, Kwame Nkrumah University of Science and Technology, University of Cape Town, University of the Western Cape, OER Africa, and University of Michigan.
Johnson & Johnson	2001–	Has a twenty-year history of corporate social responsibility aimed at HRH. Investments include physician training support, nurse campaign for the future, and scholarships for nurse training in partnership with Aga Khan nursing schools.
W.K. Kellogg Foundation	1980s	Invests extensively in human resource development through scholarships.
		Funds a program in Malawi to train midwives and nurses. This project complements support for community development rather than serving as a means for nurses and midwives to earn higher income.
Kresge Foundation	2007–2010	Joins Partnership for Higher Education in Africa (PHEA).
John D. and Catherine T. MacArthur Foundation	2000–2010	Joins Partnership for Higher Education in Africa (PHEA).
	2009	Establishes a new program for higher education in Russia.

Andrew W. Mellon Foundation	1995	Initiates grant-making program Higher Education and Scholarship, with special emphasis on South Africa.
	2005–2010	Joins Partnership for Higher Education in Africa (PHEA).
David and Lucile Packard Foundation	2008–2012	Supports the Ministerial Leadership Initiative for Global Health (MLI), a practice-based model of leadership development of the Aspen Institute to strengthen capacity with Ministries of Health in five countries: Ethiopia, Mali, Nepal, Senegal, and Sierra Leone.
Public Health Foundation of India	2006–	Focuses on capacity building to strengthen public health training, education, and research and policy development. Programs support training and attracting public health professionals to improve population health and address shortage of health care personnel. Projects include establishing regional institutes of public health across India, postgraduate diploma programs, international training fellowships, training programs for health personnel, and technical workshops.
Rockefeller Foundation	1900s	In collaboration with the Ford Foundation, establishes demographic research programs in developing countries.
	2000–2010	Joins Partnership for Higher Education in Africa (PHEA).
	2003	Convenes the Joint Learning Initiative on Human Resources for Health (JLI-HRH). The HRH crises in developing countries and the international brain drain of doctors and nurses were brought to the top of the international agenda.
	2009	Launches Transforming Health Systems (THS) initiative in Nairobi, Kenya, to expand health coverage and provide new health and financial protections for people in low-income communities.

Save the Children*	2010	Launches the Good Goes campaign with Ad Council, focusing on improving newborn and child survival by supporting frontline local health workers.
Touch Foundation*	2004	Founded in 2004, leverages funding to grow health care worker and management resources in southern Tanzania through work with the Minister of Health and local programs.
Wellcome Trust	2009	Launches Malawi's Health Research Capacity Strengthening Initiative (HRCSI) to improve the capacity of Malawian researchers to conduct high-quality research. Goals of the five-year project are to develop the human capacity to produce health-related research and to generate health systems research products.

Note: *2011 Global Summit partner.

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Ann E. Kurth conceived and developed the concept and outline for an earlier version of this paper and contributed to this version of the manuscript.

Amy Hagopian drafted an early version of this manuscript that served as a background paper for the Global Summit and contributed to this later version.

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