

HIGH-LEVEL MINISTERIAL MEETING ON INVESTING IN HUMAN RESOURCES FOR  
HEALTH FOR SUSTAINABLE DEVELOPMENT

BACKGROUND PAPER

## **Community-level Human Resources for Health:**

Return on Investment and Pathway to Universal Health Coverage

in Sub-Saharan Africa

**Henry B. Perry, MD, PhD, MPH<sup>1</sup>**

**Sennen Hounton, MD, PhD, MPH<sup>2</sup>**

**July 2015**

<sup>1</sup> Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA

<sup>2</sup> Technical Adviser, United Nations Population Fund, New York, NY, USA

### Abbreviations

AAAAQ	availability, affordability, accessibility, acceptability, and quality
ASM	<i>Agent de Sante Maternelle</i>
CBPF	community performance-based financing
CHA	Community Health Agents
CHW	community health worker
DALYs	disability-adjusted life-years
DOT	directly observed treatment
GDP	gross domestic product
HDA	Health Development Army
HEW	Health Extension Workers
HRH	human resources for health
HSDP	Health Sector Development Plan
ICPD	International Conference on Population and Development
IMCI	integrated management of childhood illness
MDGs	Millennium Development Goals
NGO	non-governmental organization
PEPFAR	President's Emergency Plan for AIDS Relief
PMNCH	Partnership for Maternal, Newborn and Child Health
ppp	purchasing power parity
PSF	<i>Programa Saúde da Família</i> (Family Health Programme, Brazil)
RMNCAH	reproductive, maternal, newborn child and adolescent health
SDGs	Sustainable Development Goals
TB	tuberculosis
VLY	value of additional life-years
WHO	World Health Organization

## I. Introduction

2015 is a transition and threshold year in terms of improving the lives of those who are severely impoverished and who are suffering and dying from readily preventable or treatable conditions. The era of the Millennium Development Goals (MDGs), from 2000 to 2015, and their emphasis on reducing poverty and improving health, is now drawing to a close with mixed success. There have been notable achievements in many countries, and slow progress in others. And we are entering a new era in September 2015 at the United Nations General Assembly meeting in New York City when the Sustainable Development Goals will be embraced, to guide not only development efforts in low-income countries but also development policies and programmes for governments throughout the world. Going forwards, the Sustainable Development Goals will serve us for the next 15 years as a common framework for addressing the well-being of the entire human family, social inclusion in all societies, and environmental sustainability.

The health component of the Sustainable Development Goals calls for universal health coverage. Above all, this means giving everyone ready access to primary health care as defined in the 1978 Declaration of Alma-Ata:

Primary health care is essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination.<sup>1</sup>

UNFPA, UNICEF, the World Health Organization, the World Bank, other organizations and governments from around the world, including many governments from Africa, are now endorsing the campaign to end preventable child and maternal deaths by the year 2035,<sup>2,3</sup> which calls for reducing levels of under-5 mortality in all countries and in all sub-populations of those countries to levels achieved by the developed world in the mid-20th century – 20 deaths per 1,000 live births and a maternal mortality ratio of 70 deaths per 100,000 live births.

We are now entering a new era during which the world has the potential to achieve in one generation what is being called a “grand convergence in health”<sup>4</sup> by the year 2035. This term is used to indicate that low-income and middle-income countries would achieve an under-5 mortality rate of 16 deaths per 1,000 live births, an annual AIDS death rate of 8 per 100,000 population, and an annual tuberculosis death rate of 4 per 100,000 population – also referred to as 16-8-4.<sup>4</sup>

And, of course, there is the dream of achieving Health for All, first articulated at the 1978 International Conference on Primary Health Care that was attended by representatives from 134 countries. This was envisioned to be achieved by the year 2000, but now is the time to regroup and begin to formulate a plan to assure that we will achieve this goal at least by the year 2100!

2015 is an opportune moment to highlight the critical need to build stronger primary health care programmes throughout the world, to support frontline health workers who are the providers of primary health care services, and to build strong national community-based health programmes to serve

as the foundation of health systems. There is increasing evidence that readily available local health services provided by community-level health workers and at readily available facilities, including those where safe deliveries can be performed and where ready access to referral care for complications is available, will be essential for achieving universal access, for finally attaining the MDGs for health, and for eventually achieving Health for All as envisioned at Alma-Ata.

In order for countries to achieve the “grand convergence” by 2035 and to have primary health care systems able to respond to the growing need for detection and treatment of chronic diseases as well as for promotion of healthier lifestyles, countries will need to increase their investment in health. They will need to strategically focus this investment to make it as productive as possible.

This paper makes the case for why countries in Africa should invest in community-level human resources for health as one of the most effective investments not only for improving health but also for promoting economic growth and broader socioeconomic development. We will first review the broader case for investing in health and then review the case for investing in human resources for health and specifically the case for investing in community-level human resources for health.

## **II. The case for investing in health**

Although the value of investing in health may seem obvious, it is also obvious that there are many competing demands on the budgets of governments. Making the case persuasively has often been a challenge, especially against demands for security, national defense, and promotion of economic development.

### **Health in and of itself is highly valued by people and access to basic health care is a universal human right**

The fact that good health is a priority in its own right cannot be overstressed. Health, like education, is among the basic capabilities that give value to human life and that create human capital, one of society’s basic building blocks.<sup>5</sup> The value for health is evidenced in many ways, not the least of which is the vast sums spent in highly developed countries on health care. In the United States, for example, current per capita spending is 17% of the national gross domestic product (GDP) and amounts to US\$8,745 per capita per year.<sup>6</sup> The Universal Declaration of Human Rights, adopted by the General Assembly of the United Nations in 1948, resoundingly affirms that “Everyone has the right to life, liberty and security of person,” that “Everyone has the right to a standard of living adequate for the health and well-being of himself and his family, ...including medical care,” and “Motherhood and childhood are entitled to special care and assistance.” We would argue that in today’s context, the “right to life” includes the universal right to accessible basic health care services that are effective for preventing and treating serious health conditions.

Over the past 40 years, economists have recently developed a new approach to measuring the value that people place on health and estimating the contribution that improved health makes to a country’s “full income,” taking into account the economic value of reductions in mortality – that is, the economic

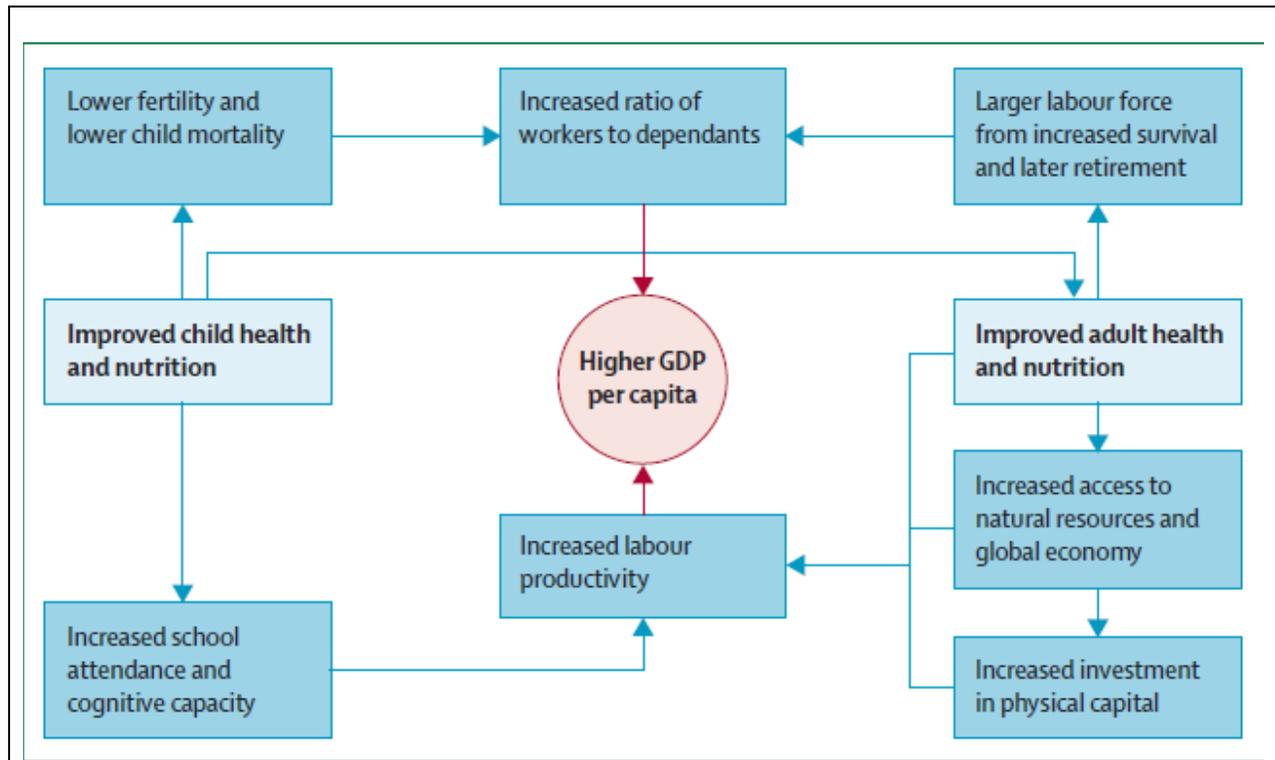
value of living longer. By computing an economic value of additional life-years gained (VLYs) and adding this to the country's economic output during a given period of time, then a country's "full income" can be estimated. A VLY is the value in a particular country or region of a 1-year increase in life expectancy. The recent *Lancet Commission on Global Health 2035: a world converging within a generation* estimates that in low-income and middle-income countries, one VLY is 2.3 times the per-person income.<sup>4</sup> As we shall see later, using what is now referred to as the "full-income" approach, the case for investing in health to improving a country's "full income" becomes even stronger.

National governments are responsible for the health and well-being of their citizenry. This is enshrined in nearly every constitution. Thus, governments are responsible for using resources wisely and effectively to promote the public's health. In 1978, the largest global health conference held up until that time, with delegations from 134 governments and representatives of 67 United Nations organizations, specialized agencies and non-governmental organizations, gathered at Alma-Ata and committed themselves to achieve "Health for All by the Year 2000." Obviously, this lofty goal was not reached in 2000 and still has not been reached, but it remains and will remain a universal aspiration. The International Conference on Population and Development (ICPD) in 1994 further enriched this discussion by adding a universal human rights perspective to issues of access to health care.

### **Investing in improving the health of populations is good for economic development**

The ways in which better health stimulates economic growth are manifold (Figure 1). Healthier people are more productive. Healthier children are more likely to attend school and have greater cognitive capacity for learning, and improved education is a powerful mechanism of income growth. Good health is the basis for the capability to grow intellectually, physically and emotionally. Good population health is the foundation for poverty reduction, economic growth, and long-term economic development.<sup>7</sup> Increased life expectancy is an incentive to save for retirement, which can expand the national savings rate, which in turn can expand investment and economic growth. Control of endemic diseases such as malaria and river blindness can increase human access to land and other natural resources.

Reductions in child mortality lead to reduced fertility. There is broad consensus that one of the longer-term effects of declining child mortality (following a short-term increase in the number of children) is fertility reduction – the common explanation being that "women won't start having fewer children until they know that the ones they do have will live."<sup>8</sup> Coupled with the creation of enabling national policies to support empowerment, education and employment, rights-based family planning and other support leads to an increased ratio of working people (15–64 years of age) to dependants (children and people 65 years of age and older) and subsequent increased economic growth, a phenomenon known as the demographic dividend.<sup>4</sup>



**Figure 1. Links between health and GDP per person<sup>4</sup>**

The seminal 1993 World Development Report published by the World Bank<sup>9</sup> was one of the first high-level documents to highlight the “instrumental value” of improved health (i.e., better health improves worker productivity) thereby supporting the argument that investment in health is good for economic growth. It was one of the first influential publications to give high-profile attention to the benefits that could accrue from increased public sector spending on health, especially when targeted to a specific set of diseases and interventions, and to intersectoral action such as improving water, sanitation, food regulation, education, and tobacco control, as well as taxation to finance these activities.<sup>4</sup> One reason the 1993 report was so influential is because it was read by finance ministers.<sup>4</sup> It gave emphasis to the concepts of burden of disease and cost-effectiveness, though the report was also seen by many as a “costly retreat from rights-based approaches to health and education.” The concept of DALYs (disability-adjusted life-years), now a standard metric for assessing health impact and cost-effectiveness of investments in health, emerged from the 1993 World Development Report as well.

Seven years later, in the year 2000, the World Health Organization’s Commission on Macroeconomics and Health,<sup>7</sup> chaired by Jeffrey Sachs, released its own seminal report, again forcefully making the case that improving the health and longevity of the poor in low-income countries and in lower-middle-income countries is not only important for that benefit alone but also important for poverty reduction and long-term economic growth because, among others reasons, a healthier population has a more productive workforce and diseases such as malaria and HIV that affect large numbers of people produce

a drain on economic development. The report highlighted that the interventions required to improve health can be delivered in a “close-to-client” system that requires a “foundation of strong community-level oversight and action, in order to be responsive to the poor, in order to build accountability of local services, and in order to help ensure that families take full advantage of the services provided.”<sup>7</sup>

The Ebola outbreak of 2014 that is still lingering on has highlighted the weakness and the lack of resilience of the health systems of West Africa and the potential major economic consequences of epidemic outbreaks that are not brought quickly under control. The governments of Guinea, Liberia and Sierra Leone are now estimated to lose US\$ 3.6 billion per year between 2014 and 2017 as a result of the Ebola outbreak (from loss of trade, closure of borders, cancellation of flights, and decreased investment),<sup>10</sup> not to mention the more than US\$ 4.3 billion spent by the global community to contain it.<sup>11</sup>

The *Lancet Commission Global Health 2035: a world converging within a generation*, which released its report in 2013 that summarizes the evidence on why the low- and middle-income countries and the international community should increase its investment in health, concludes its case forcefully:

The totality of this new evidence points to an important major conclusion. In the allocation of finite budgetary resources, making the right investments in health improves social welfare and stimulates economic growth.<sup>4</sup>

Using the “full-income” approach described earlier, economists now have been able to quantify the economic value that people place on living longer by carrying out “willingness-to-pay” studies that quantify how much people are willing to pay for safe living and working conditions and how much higher wages they would require in order to take on dangerous, life-threatening work. These studies now demonstrate that value of improved life expectancy in sub-Saharan Africa has contributed to annual growth in full income by almost 6% of the initial value of GDP for the period 2000–2011.<sup>4</sup> The economic value of eradicating AIDS would be approximately the same as the value of the annual economic output of the entire continent of Africa (about US\$ 800 billion).<sup>4</sup> An analysis of historic, microeconomic and macroeconomic studies concluded that using the “full-income” approach 11% of economic growth in low-income and middle-income countries during the period from 1970 to 2000 could be explained by reductions in adult mortality.<sup>4</sup> Between 2000 and 2011 about 24% of the growth in full income in low-income and middle-income countries resulted from health improvements.<sup>4</sup>

Investments to improve the health of women and children as a result of lives saved, morbidity averted, enhanced workforce participation as a result of better health outcomes, and family planning (producing, among other things, lower dependency rates and increased workforce participation) would gradually accrue over time, and have been estimated to produce benefit-cost ratios of 4.8 for economic benefits alone and 8.7 for total benefits at a 3% discount rate over the period to 2035.<sup>12</sup>

### III. The case for investing in human resources for health

Investing in human resources for health is one of the most productive ways to invest in health. The *2006 World Health Report – Working Together for Health*<sup>13</sup> brought unprecedented attention to the importance of human resources for health, the heart of each and every health system, emphasizing that progress of low-income countries in expanding immunization coverage, increasing the outreach of primary health care, as well as reducing infant, child and maternal mortality are all strongly correlated with the density of health workers in the population and with a threshold workforce density below which high coverage of essential interventions will be very difficult.

Health programmes and health services cannot be effective without adequate numbers of health staff who are appropriately trained and supported – and who are recruited and deployed according to needs, properly supervised, and work in safe environments. Many health workers are at risk for HIV, TB, hepatitis, violence, accidents, viral haemorrhagic fevers such as Ebola, and other harms as a direct result of their work. The emphasis needs to be not just on the actual numbers in the health workforce but on the degree to which the workforce is “adequate, skilled, well-trained and motivated.”<sup>14</sup> And of course, high levels of turnover make it hard for health systems to be effective.

A strong health workforce will be critical for achieving health and wider development objectives in the next decades.<sup>15</sup> Unfortunately, human resources for health have not received the attention and support that they should have over the past several decades, leading to a situation globally in which a crisis has arisen that must be overcome.<sup>16, 17</sup> The Sustainable Development Goals (SDGs), to be adopted in September 2015 at the annual meeting of the General Assembly of the United Nations in September, will be guiding global development over the next 15 years, and the overarching goal is a “life of dignity for all,”<sup>18</sup> with the health goals of the SDGs giving a renewed focus to health equity and to universal health coverage. None of these can be met without substantial increases in the recruitment, training, deployment and retention of the health workforce in developing countries, particularly in sub-Saharan Africa.

New evidence is starting to emerge on the broader socioeconomic impacts of health workforce investment through its growth-inducing effect on other sectors, particularly through its effects on providing increasing employment opportunities for women.<sup>19</sup> Thus, not only is investment in the health sector productive for economic growth, so is investment in the health workforce.

Health workers need to provide services that meet the criteria of availability, affordability, accessibility, acceptability, and quality (AAAAQ). Accessibility and acceptability mean, among other things, treating clients with dignity. Quality with due regard for social justice and equity should be achieved through a variety of resources that are financially and fiscally sustainable, taking into account the contributory capacity of rural populations and creating fiscal space through various methods including the prevention of fraud, tax evasion and non-payment of contributions, as well as increased efficiency and effectiveness in the provision of health care.<sup>20</sup>

## Human resources for health needs in Africa

The Africa region has 24% of the global burden of disease but only 4% of the world's health workers and less than 1% of the world's health expenditures.<sup>13</sup> The *2006 World Health Report* estimated a global deficit of 2.4 million doctors, nurses and midwives in 57 countries, including 36 that are in Africa.<sup>13</sup> In the WHO African Region, there are 2.3 health workforce members (including health management and support workers) per 1,000 population compared with 18.9 in Europe, 24.8 in the Americas, and 9.3 globally.<sup>13</sup> In 2006, 36 of 46 countries in the WHO African Region had a critical shortage of doctors, nurses and midwives (failing to meet the target of 2.28 doctors, nurses and midwives per 1,000 population). The report estimated a critical shortage of 818,000 doctors, nurses and midwives in the WHO African Region, while the current number at that time was 590,000. Thus an increase by 139% would be needed to resolve this shortage. And, of course these national statistics do not reflect the marked rural–urban disparities that exist in all countries. High attrition rates exist, especially in countries with shortages, due to low pay (or unpaid earned wages), stress, illness, death, and migration out of the country. Surprisingly, those countries with the highest shortages also tend to have large numbers of unemployed health professionals.<sup>13</sup> The *2006 World Health Report* called for a 10-year plan of action to address human resources for health issues, and led to the formation of the Global Health Workforce Alliance and numerous other conferences and resolutions at the World Health Assembly.

## IV. The case for investing in community-level human resources for health

Over the past two decades, there has been a dramatic growth in the evidence demonstrating that community-based service provision by community-level workers supported by other health professionals outside of health facilities is effective in improving the health of underserved populations by expanding access to key health care services and promoting healthy behaviours. It is becoming increasingly clear that community health worker programmes are not a short-term, second-class approach to addressing the health needs of underserved communities but rather are a foundational and essential component of world-class health programmes — and they are essential not only for addressing the health needs of mothers and children but also for addressing chronic conditions and the health problems of the elderly.<sup>21, 22</sup> The evidence shows that programmes using outreach workers that visit homes and provide preventive and curative services in these homes are effective in rapidly increasing coverage of key services and reducing mortality in neonates and children, and home-based delivery of family planning services by community-level workers is one of the most effective ways of meeting the unmet demand for contraception.<sup>23</sup>

Research that my colleagues and I have recently completed<sup>24</sup> demonstrates that if we were to achieve 90% coverage of interventions that we know are effective in reducing the number of deaths of mothers and their offspring and that can be provided by community health workers in the Countdown to 2015 countries of sub-Saharan Africa, we would save approximately 2 million lives per year. This represents a 35% reduction in the current number of maternal deaths, stillbirths, neonates, and children younger than 5 years of age. Expanding the coverage of family planning service to address the unmet need for family planning has important further health benefits for reducing the number of maternal deaths,

stillbirths, and neonatal mortality. The interventions that would save the greatest number of lives are (in order of number of lives saved):

- immunization of children against pneumococcus, a common cause of childhood pneumonia (this vaccine is now being introduced in many African countries);
- treatment of diarrhoea with oral rehydration solution and zinc;
- oral antibiotic treatment of childhood malaria;
- oral antibiotic treatment of childhood pneumonia;
- insecticide-treated bednets and indoor residual spraying (against malaria);
- thermal care of the newborn (to prevent hypothermia);
- resuscitation of newborns with asphyxia;
- clean postnatal practices;
- oral antibiotics for neonates with sepsis;
- breastfeeding promotion (especially immediate breastfeeding after birth and exclusive breastfeeding during the first 6 months of life).

Although family planning interventions were not included in this model, nevertheless both the UN Commission on Life-Saving Commodities for Women and Children and the Global Financing Facility discussion on reproductive, maternal, newborn child and adolescent health (RMNCAH) now highlight family planning as a key contributor to saving lives. It is well known that expanding family planning services to eliminate the unmet need for family planning would reduce maternal mortality by 29% (including deaths related to unsafe abortion),<sup>25</sup> and ensuring a birth interval of at least 2 years would reduce infant mortality by 10% and mortality of children 1–4 years of age by 21%.<sup>26-28</sup>

It is not possible or practical in the foreseeable future to achieve a high level of population coverage of high-impact interventions through service provided by higher-level health workers based at health facilities. People, especially mothers with young children, are not likely to travel more than 3–4 km for routine services. A major expansion in the number of facilities and the number of higher-level health staff required would be a substantial financial burden and would take quite a long time, especially since there is an effective lower-cost option available that can be implemented more quickly. There is no other set of interventions or approaches that will be as effective in reducing readily preventable mortality in the population.

A global development priority-setting project referred to as the Copenhagen Consensus in 2012<sup>29</sup> used a full-income approach to prioritize investments for development – not just in health but in all areas of development. All five of the top development investment opportunities were in health, and all require an expanded capacity for health services at the community level. These were as follows:

- bundled micronutrient interventions to fight hunger and improve education;
- expanding malaria treatment;
- expanded childhood immunization coverage;
- deworming of schoolchildren; and,
- expanding tuberculosis treatment.

The Sachs Commission (Macroeconomics and Health: Investing in Health for Economic Development) concluded the following:

The essential interventions ... [required to improve health] are not technically exacting. Few require hospitals. Most can be delivered at health centres, at smaller facilities that we refer to as health posts, or through outreach services from these facilities. We call these collectively the *close-to-client (CTC)* system, and this system should be given priority to make these interventions widely accessible [p. 7].<sup>7</sup>

### **Benefits from providing readily accessible high-quality reproductive health services**

Homer et al. have estimated that 83% of all maternal deaths, stillbirths and neonatal deaths could be averted if 95% of all pregnant women in the poorest countries<sup>a</sup> received pre-pregnancy, antenatal, labour, birth and post-partum care, including family planning, from professionally trained midwives.<sup>30</sup> Their approach assumes that a midwife is a graduate of a midwifery programme and has a higher-level of skill than would be available to community health workers since a midwife would meet the standards of essential competencies for basic midwifery practice and be duly registered or legally licensed.<sup>31</sup> Such a person would need to be based in or have close links to a health facility. Such an individual would be able to provide post-abortion care, antenatal corticosteroids for preterm labour, antibiotics for premature rupture of membranes, magnesium sulfate for treatment of eclampsia, induction of post-term labour, and maternal sepsis case management. These are interventions that are beyond the scope of community health workers to provide in the community outside of a facility.

A strong midwifery programme with midwifery services strategically positioned to be reasonably accessible to the population (e.g., not more than 10 km or 1.5 hours away) would provide a powerful complement to a strong community-based programme in which community health workers provide evidence-based maternal, neonatal, and child health interventions. The midwifery model proposed by Homer et al. would reduce maternal mortality and stillbirth by 81.5% and 75.9%, respectively, among the poorest countries. Together, a strong midwifery service delivery programme where antenatal, labour, birth and post-partum care could be provided at a simple locally available facility together with a strong programme of delivery of community-based delivery of interventions reaching every household for preventive and curative services not covered by midwives will be needed to provide the best available impact on maternal, perinatal, neonatal and 1-59-month mortality.

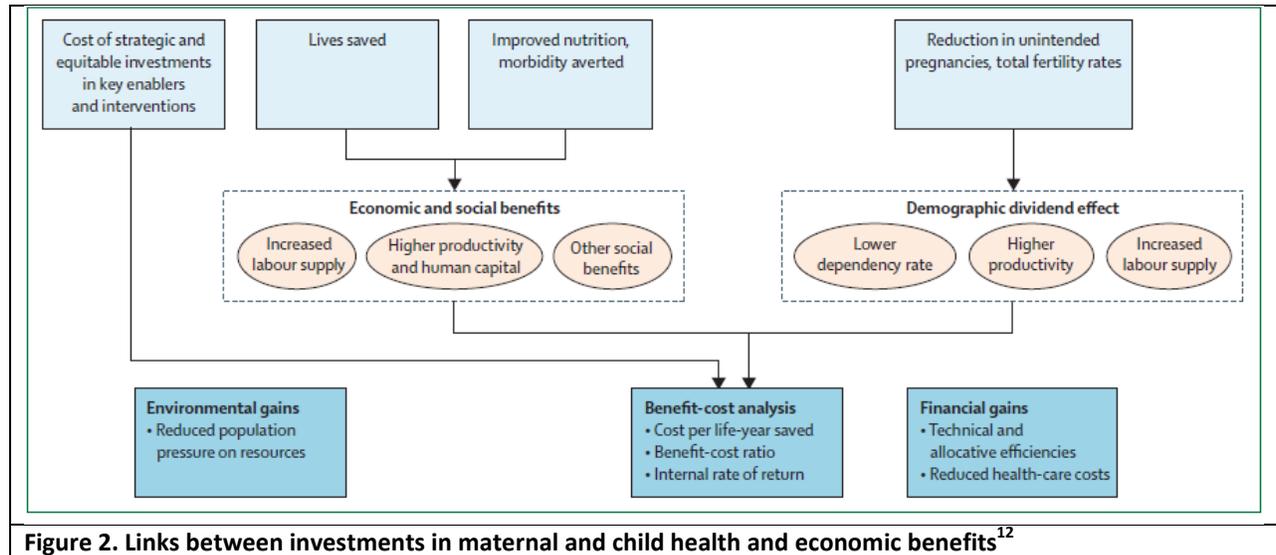
### **Investing in women's and children's health: a new global investment framework**

In response to a recommendation in 2012 by the United Nations independent Expert Review Group on Information and Accountability for Women's and Children's Health (iERB), WHO, the Partnership for Maternal, Newborn and Child Health (PMNCH) and the *Lancet* Commission on Investing in Health coordinated the development of a global framework for women's and child's health as shown in Figure 2.<sup>12</sup> Using available evidence-based interventions and increasing health expenditures by just US\$ 5 per person per year up to the year 2035 in 74 high-burden countries (over half of which are in

---

<sup>a</sup> The countries included in this analysis were from 78 low- and middle-income countries and were in the bottom third in their score on the Human Development Index. Many of the countries were from sub-Saharan Africa.

sub-Saharan Africa) would yield to up to nine times that value in economic and social benefits through increased productivity and prevention of needless deaths. This achievement would require an additional 675,000 midwives, nurses and doctors and 544,000 community health workers. Almost all of the interventions can be provided in the community in homes, in village health posts or at first-level primary health care facilities.



**Figure 2. Links between investments in maternal and child health and economic benefits<sup>12</sup>**

### **Additional benefits from surveillance and vital events registration**

Stronger community-based service provision by community health workers through routine systematic home visitation has enormous potential for surveillance for disease outbreaks (such as Ebola, measles, cholera, and outbreaks of life-threatening respiratory illnesses such as SARS and MERS) that require a response from higher levels in the health system. Furthermore, registration of vital events (births and deaths) and incorporation of this information into the civil registration systems of countries is an important contribution that community health workers could make, especially with the advent of mHealth that will make it possible for community health workers to officially record vital events into national civil registration systems. In Africa the percentage of the population with a well-functioning vital events registration systems has not changed in 40 years and is still less than 7%, and the percentage of deaths for which a cause has been identified and recorded in the civil registration system is even less.<sup>32</sup> This has been called “the single most critical failure of development for over 30 years.”<sup>33</sup>

### **Investing in health systems strengthening and primary health care more broadly**

In addition to community health workers, we need investments in the primary health care team that not only includes community health workers but trained midwives, community practitioners, auxiliaries, mid-level health professionals of all types, nurses and physicians – so called *frontline health workers* – who provide first-level access to preventive and curative services. The entire primary health care workforce has been under-resourced, and now is the time to revitalize it.

But achieving the proper balance of investment in the different tiers of the health system has been and will continue to be major challenge. For too long, hospitals have received the lion's share of government resources for health, at the expense of investment in primary health care and the primary health care workforce. In stark contrast to the abundance of evidence regarding the favourable impact of investments in community health workers in improving population health, there is in fact almost no evidence that investing in hospitals alone has a favourable impact on population health in low-income settings.

For decades now, health systems and governments have given top priority to investing in hospitals, especially tertiary care facilities in urban areas. The *2008 World Health Report – Primary Health Care, Now More Than Ever*<sup>34</sup> referred to this phenomenon as “hospital centrism.” Hospitals, of course, are an essential ingredient of any health system as well as the basic and essential surgical services provided there. However, a proper balance is required, and investing in hospitals to the exclusion of primary health care services and community-level programmes in particular is not a cost-effective use of funds. The utilization of these tertiary-level hospital facilities tends to be greater among those who are better off financially and who live nearby, leaving those in far-away settings without effective access.

Unfortunately, national investment in community-level health services has been inadequate. One analysis in Bangladesh revealed that 65% of public sector (government) expenditures for health services went to hospitals and only 19% to primary health care. We need more analyses of this type to demonstrate the under-funded nature of primary health care in low-income countries. One famous report from 1978 in Ghana provides a dramatic example of the distortions that have occurred over the past half-century in government funding of health systems: 40% of the government health budget went to tertiary hospitals that provided care for 1% of the population, while primary health care services, which were used by 90% of the population, received only 15% of the budget. In this case, 85% of the budget went for hospital services.<sup>35</sup>

The picture has not significantly changed today in Africa except in a few countries with strong nationwide community-oriented primary health care programmes such as in Ethiopia and Rwanda, as we will discuss shortly.

### **The need for services nearby**

In practical terms, and in terms of human rights, access to health care requires that services be close to where people live. Numerous studies have shown that the utilization of health services at facilities decreases exponentially with one's distance from the facility.<sup>36-40</sup> Once a family is more than 3–4 km or more than 90 minutes in travel time from a health facility, the likelihood of obtaining services from that facility is greatly reduced (Figure 3). And of course in many rural areas of Africa the great majority of the population lives more than 4 km or 90 minutes from a health facility.

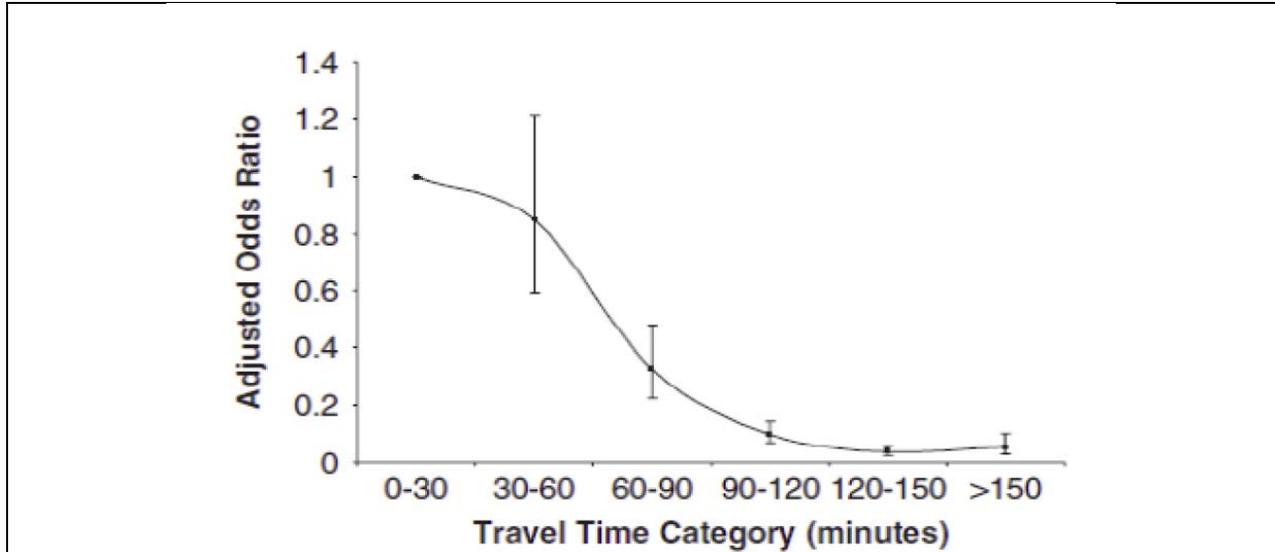


Figure 3. Utilization of primary health care facilities in rural South Africa by travel time to facility<sup>40</sup>

And, many studies also demonstrate that those who do utilize health facilities are better off than those in the population that do not utilize the facilities.<sup>37-39</sup> Thus, in areas where facilities are not readily available, their utilization is inequitable, meaning that the poorer segments of the population – who are also more likely to live further away – do not benefit from these services to the same degree. Moreover, studies have demonstrated that one of the reasons community-based health interventions are more cost-effective than facility-based health interventions is that only a small percentage of the population (which is also better off) obtain care from facilities while community-based interventions are more effective at reaching the majority of the population (which is worse off) living further away from facilities without care.<sup>41, 42</sup> Community-level workers backed up by skilled professionals at functioning referral centres are able to reduce inequities in health care utilization and reduce maternal, neonatal, and under-5 mortality, as numerous studies have shown.<sup>43-45</sup>

Even though community health workers have a major role to play in strengthening health systems by improving their outreach and impact on population health, we also need stronger investments in the facility-based primary health care workforce, not only to provide community health workers with training, supervision, and logistical support, but also to care for the patients who come there seeking health care and to provide referral care for patients identified by community health workers as needing higher-level care.

Community health workers cannot provide comprehensive care for all community health needs, of course. Community health workers must be seen as only one component of a human resource policy and need to be integrated into overall assessments of human resource requirements. They are not substitutes for higher-level personnel, but they can, with proper training, supervision and support, extend the reach and effectiveness of higher-level health staff. Although they are “not a panacea for weak health systems,” as Haines et al. point out in their seminal article on community health workers in the *Lancet*,<sup>46</sup> the evidence strongly suggests they need to be playing a much stronger role in service

provision than they have in the past. More than three decades after the Alma-Ata Declaration, these authors claim, “the time is right to assess the potential contribution of community health workers in accelerating coverage of essential interventions, particularly in poor and underserved communities.”<sup>46</sup>

## **V. The benefits for national development of investing in human resources for health at the community level**

Beyond the immediate effects on improved health that can come from making the right investment in human resources for health at the community level, there are other significant benefits for national development that are important to note.

### **Improving nutritional status**

Improvement of the nutritional status of mothers and children is good for national development because it leads to greater productivity of the workforce. There are numerous longitudinal studies, summarized recently,<sup>4</sup> that demonstrate that better-nourished children have better cognitive functioning later in life, higher educational attainment, greater worker productivity, and higher incomes. The best current evidence now indicates that undernutrition (including foetal growth restriction, stunting, wasting, vitamin A and zinc deficiencies and sub-optimal breastfeeding) is a cause of 45% of all child deaths and responsible for 3.1 million child deaths annually.<sup>47</sup>

There is rapidly growing evidence that community-based approaches to nutrition improvement by community health workers are effective, and routine systematic home visitation by community health workers is one of the best ways to achieve high levels of coverage micronutrients (iron, zinc, folate, and vitamin A),<sup>45</sup> deficits of which are one of the major causes of childhood undernutrition,<sup>47, 48</sup> and to promote healthy nutritional behaviours in the household, including optimal breastfeeding.<sup>49</sup>

### **Reducing mortality**

As we have already demonstrated, investing in health in ways that reduce the number of deaths in the population is good for national development. There is no question now that the most productive and cost-effective investment in health to save lives is through community-based approaches to increase the coverage of key interventions (including family planning services) to reduce maternal, perinatal, neonatal, and child mortality. We have already explained how community health workers can expand the coverage of key interventions that will reduce child deaths and the current low coverage of the interventions in Africa.

### **Expanding contraceptive use**

Increasing the contraceptive prevalence rate in response to meeting the unmet demand for family planning is good for saving lives and also for promoting national development. In fact, there is now growing appreciation of the importance of family planning as perhaps the single most important intervention to help countries achieve all the MDGs.<sup>50, 51</sup> Birth spacing and limiting unintended births reduce child mortality in several ways. Unintended births have a higher mortality than intended births.

Children born at intervals of two or more years have lower mortality than children born at shorter intervals. Reducing the number of pregnancies also reduces the transmission of HIV infection to newborns. Also, family planning is the most cost-effective way to reduce maternal mortality – by reducing pregnancies in women who do not want to become pregnant.

But in addition to these important benefits are others. Reducing fertility makes it possible for families to invest more in the development of the fewer children they have and for girl children to attain higher levels of education since many of them drop out of school once pregnancies occur. Family planning empowers women since unintended pregnancies interrupt work and career plans. Empowering women, including their ability to achieve desired family size, is perhaps the most important driver of modern development.<sup>52</sup>

Family planning generates wealth. Per capita gross national product is highly correlated with modern contraceptive methods use. Family planning reduces aggregate demand for food and therefore has an important contribution to make in ending poverty and hunger. Family planning helps achieve universal education, and education is perhaps the single most important long-term investment societies can make in their development. Family planning promotes environmental sustainability by reducing population growth and energy consumption, and therefore carbon dioxide-induced climate change.

As shown in Figure 4, the unmet need for family planning is now about one-quarter of all women 15–49 years of age in sub-Saharan Africa. And even though the contraceptive prevalence rate in Africa has increased over the past 40 years from 5% to about 25% at present, the unmet demand has not changed during this period since demand has grown as fast as the contraceptive prevalence rate.<sup>53</sup>

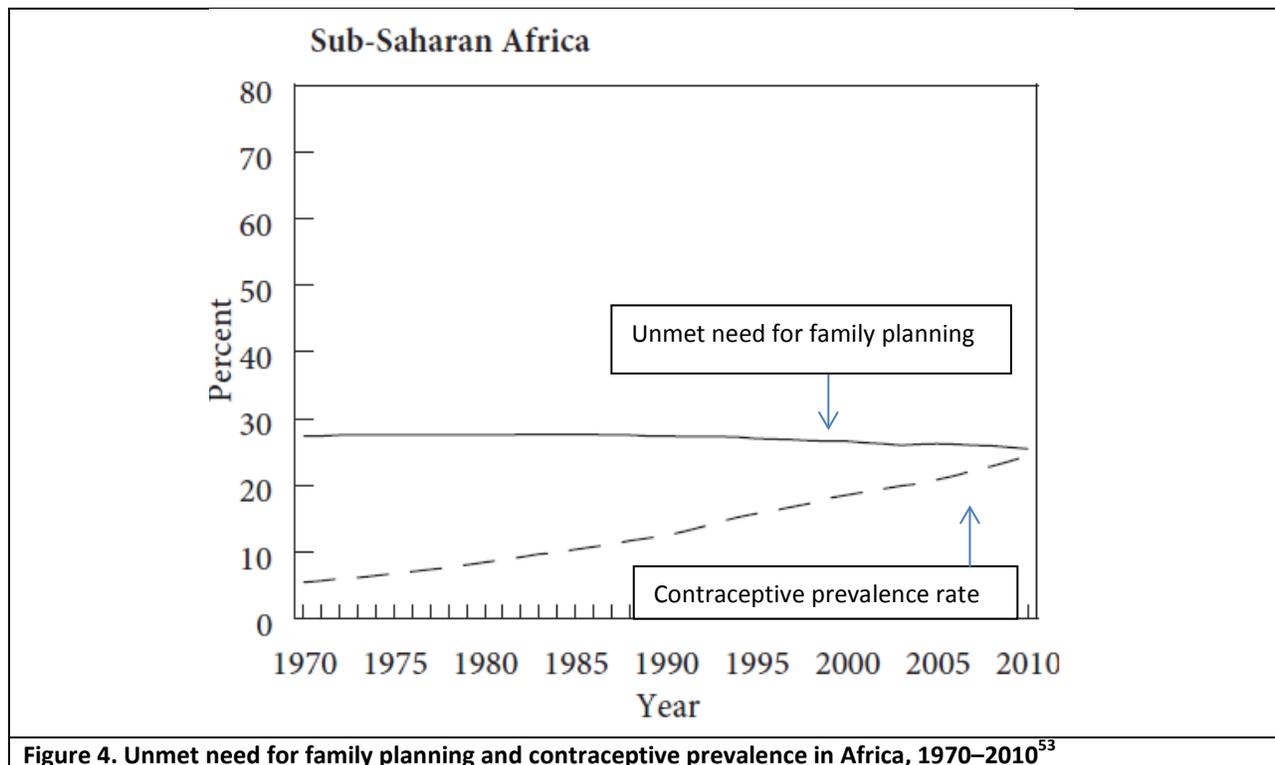
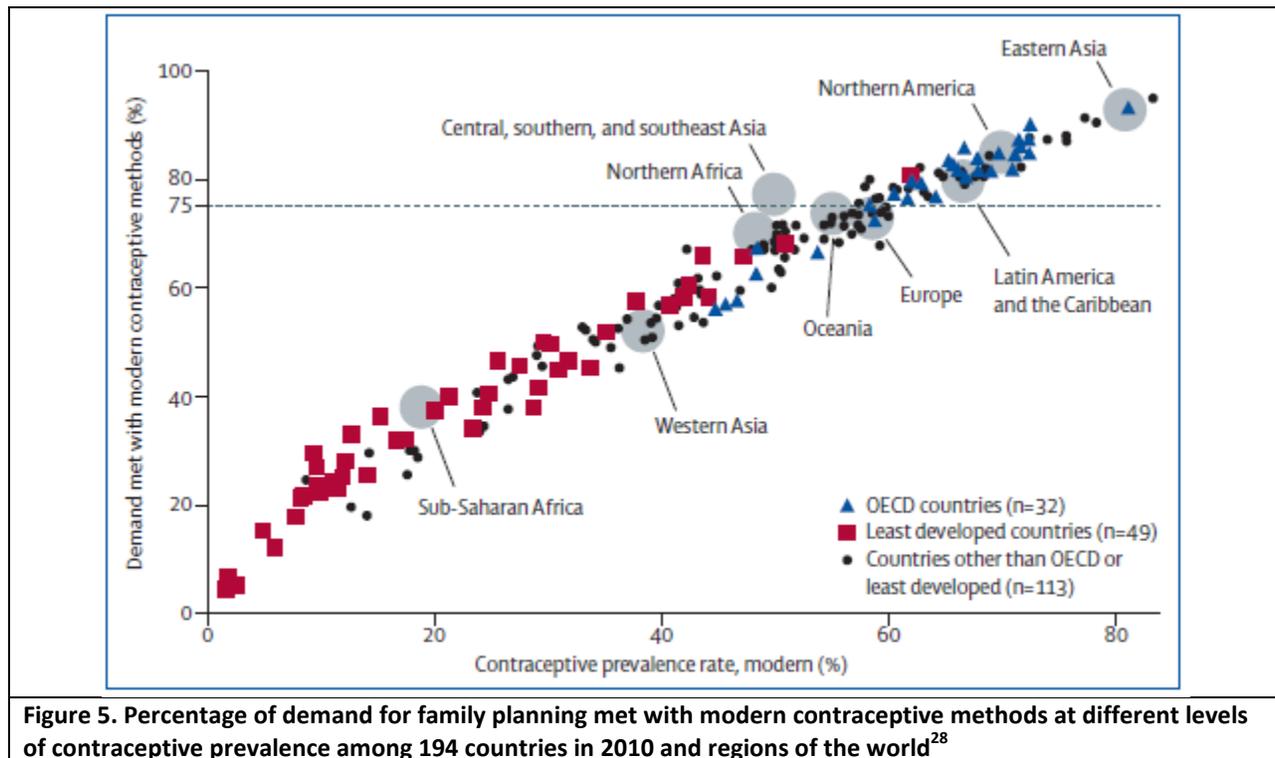


Figure 4. Unmet need for family planning and contraceptive prevalence in Africa, 1970–2010<sup>53</sup>

From our perspective, the critical point is that the community-based provision of family planning services by community health workers is the best way to quickly meet the unmet demand for family planning and increase the contraceptive prevalence rate in Africa – where much of the population is rural, facilities are few and far between, current use of family planning is still relatively low, and demand is high.<sup>23</sup> Furthermore, there is a rapidly growing experience in a number of African countries in using community health workers to provide not only oral contraceptive pills and condoms at the doorstep, but also injectable contraceptives.<sup>54-58</sup> Community health workers in Ethiopia are now inserting long-acting subcutaneous contraceptive implants, the first community health workers in the world to do this.<sup>59</sup>

As Figure 5 demonstrates, there are no developed countries with a high unmet demand for family planning services. Thus, strong investments in community-based family planning programmes specifically and sexual and reproductive health more broadly are among the most productive investments for community-level human resources for health – not only for saving lives but also for promoting environmental sustainability and economic growth, achieving the demographic dividend, and empowering women.



## VI. Community-level health worker programmes in context

We consider here community-level health workers to consist of two distinct groups: community health workers and other skilled community-based professionals, including trained community midwives. Community health workers are a diverse group themselves. They may be volunteer or paid, and work only a few hours of work per week or full-time. Their training may be a few days in length or up to a year or more. But in all cases they are recruited and trained by the health programme (often in collaboration

with the communities they will serve), and they receive no formal academic degree from a university following their training. Increasingly, dual cadre community health worker programmes are emerging – one in which a volunteer community health worker serves 10–20 households and a professional community health worker with 6–12 months of formal training serves a population of up to 2,500 people.

There is currently a broad range of community health workers at present in Africa, with varying lengths of training, varying responsibilities, varying forms of incentives and remuneration, and attachment to both government and NGO health programmes.<sup>60</sup> A rough estimate is that there are approximately 500,000 community health workers in Africa.<sup>21</sup> We envision here a system of community health workers that would work from a local village health post and/or engage directly with the community through home visits to deliver basic curative services and implement evidence-based life-saving interventions that have been shown to be able to be provided by community health workers, including family planning services. Community-based midwifery provided by well-trained health workers is not a well-developed professional cadre at present, but as envisioned here they would be based at a facility below the level of a primary health care centre from which they can perform safe deliveries and provide antenatal and post-partum care, including family planning.<sup>30</sup>

This person would be a graduate of a midwifery programme and have a higher-level of skill than would be available to community health workers since a midwife would meet the standards of essential competencies for basic midwifery practice and be duly registered or legally licensed.<sup>31</sup> Such a person would need to be based in or have close links to a health facility, but she may also perform home deliveries. Such an individual should be able to provide post-abortion care, antenatal corticosteroids for preterm labour or antibiotics for premature rupture of membranes, magnesium sulfate for treatment of eclampsia, induction of post-term labour, and maternal sepsis case management. These are interventions that are beyond the scope of community health workers to provide in the community outside of a facility.

A strong midwifery programme with midwifery services strategically positioned to be reasonably accessible to the population (e.g., not more than 10 km or 1.5 hours away) would provide a powerful complement to community health worker interventions for reproductive, maternal, neonatal and child health provided by community health workers outside of facilities. For sub-Saharan Africa, with its crude birth rate of 38 births per 1,000 population,<sup>61</sup> a population of 5,000 people would have on average 190 births per year, and a population of 10,000 people would have 380 births per year. Thus, it would seem appropriate to envision, depending on the distance that people would have to travel, a trained community midwifery workforce of 2–3 people would be needed for a population of 10,000, or 1–2 for a population of 5,000.

In spite of very slow progress in the development of national community-level health worker programmes in the early 1980s following the 1978 International Conference on Primary Health Care at Alma-Ata – mostly as a result of poor planning, inadequate financial support and poor health system support<sup>62</sup> – the strong evidence accumulated in the past two decades indicating that community health workers can effectively improve the health of children by proving specific interventions against

undernutrition, pneumonia, diarrhoea, malaria, and neonatal conditions has generated renewed interest in strengthening community health worker programmes.<sup>46</sup> The evidence base for building strong midwifery programmes close to the community – where those providing midwifery services are educated, trained, licensed and regulated – is beginning to accumulate.<sup>31</sup>

Although the infrastructure and health systems support required by community-level workers is modest, it is essential – for supplies and drugs, transport, supervision and access to referral care. As Lehmann and Sanders wrote in their review of community health worker programmes in 2007,<sup>63</sup> they are:

...neither the panacea for weak health systems nor a cheap option to provide access to health care for underserved populations. Numerous programmes have failed in the past because of unrealistic expectations, poor planning, and underestimation of the effort and input required to make them work.

Now that the evidence base for the effectiveness of community-level health workers is so much stronger, and the interventions they need to provide are more numerous and better defined, we need to ensure that the renewed wave of enthusiasm for national scale up of community health worker programmes does not falter like it did in the 1980s. And, as the evidence base for community midwifery grows, expansion of this programme will need to occur rapidly.

This will require, among other things, the following:

- Strong integration of community-level health programmes with higher-level primary health care services based at primary health care centres, so that they can be well supported and supervised and so patients that community health workers and community midwives identify as needing higher levels of care can receive it. This means development of communication and transport systems between the community and the primary health care centre.
- Community-level health programmes will need to be well financed, with long-term stable funding, and higher-level primary health care services will need to be better financed, particularly so that primary health care workers are better paid and supported in their work and so that there are more of them with lower turnover.
- Community-level health programmes will need to be in a state of continuing improvement, with strong and rigorous evaluations ongoing so that the programmes, which will continue to have many shortcomings, can gradually improve to reach their full potential.

We are now at a point in history where we need to recognize community-level health programmes not as a short-term, stop-gap solution to a health crisis, but rather as a long-term feature of effective health systems, even in high-income countries. As we mentioned previously, there is rapidly growing evidence regarding how community health workers in the United States can improve the health of high-risk groups, and the number of community health workers is rapidly growing. At present, there are, conservatively estimated, 175,000 community health workers in the United States.<sup>64</sup> Even within a 5-mile radius of the Johns Hopkins Hospital, arguably one of the best hospitals in the world, there is a rapidly growing cadre of community health workers.

In addition to all the other strong reasons given for strengthening and expanding community-level health programmes in Africa, we must not overlook the important fact that community health workers and trained community midwives, in contrast to nurses and doctors, are not candidates for out-migration to more developed countries. The empowering effect of being given the opportunity to work as a community-level health worker, particularly for women, enables many of them to go on to other leadership roles in their communities and make other important contributions to improving the lives of their families and communities.

The seminal 2010 report released jointly by the Global Health Workforce Alliance and the World Health Organization entitled *Global Experience of Community Health Workers for Delivery of Health-Related Millennium Development Goals*<sup>65</sup> called for a stronger commitment to community health workers, and their chief recommendation was that “The [community health worker] programmes should be coherently inserted in the wider health system, and CHWs should be explicitly included within the HRH [human resources for health] strategic planning at country and local level.” Dr. Miriam Were, one of the leaders of community health throughout Africa, recently stated:

We should not say the community health workers are the lowest tier of the health system. They are the foundation of an effective health system. The process for establishing community health is as important as the outcomes, and community empowerment is an important part. We need to help people demand their rights.

And Dr. Solange Kabide, Permanent Secretary, Ministry of Health of Rwanda, has also recently stated that “Community health workers are the hands, ears and eyes of the health system.”<sup>66</sup> The movement for a stronger community-level health workforce in Africa is gaining momentum. Now it needs financing!

## **VII. The case for investing in primary health care more broadly**

We have previously made the case for why investing in health in general is a good economic investment for countries: a healthier society is a more productive society. Healthy workers are more productive and having healthier children, adults and elderly also reduces family expenses and enables caretakers to work instead of caring for sick family members.

But our argument here is also that investing in community-oriented primary health care and services that reach out to every community and household is one of the most cost-effective investments a government can make for improving the health of its population, particularly for lower-income countries with a high burden of disease, low coverage of basic and essential services, and weak health systems. And the evidence is growing that investments in these activities is highly cost-effective even in high-income countries such as the United States – by expanding basic services to underserved populations and by reducing the utilization of expensive care (such as hospital readmissions).

The main reason that investing in community-oriented primary health care services is an ideal investment for promoting economic growth in sub-Saharan Africa is that it is the most effective way to improve the health of the population, and improved population health improves economic growth. Another economic benefit from investing in community-level health workers is cost savings. Services

provided at the community level save money – of both the patients (through fewer expenses and time lost from seeking health care and through lower fees and costs) and the health care system (by providing services at a lower cost).<sup>67</sup> Many examples exist where strengthening community-level services reduced the workload at primary health care centres. And, by preventing diseases (through community-level health promotion efforts) and providing early treatment, the risk of complications requiring more expensive treatments is diminished.

The role of community-level health workers in detecting disease outbreaks is now gaining increasing attention, particularly as their contributions to bringing the 2014–2015 Ebola outbreak under control and to polio and guinea-worm eradication are gaining recognition, and as the potentially devastating effects of a flu pandemic are being recognized. Community-level workers can play an important role in early disease detection and control.<sup>68</sup> These efforts could also be used for early detection and control of other disease outbreaks of importance in sub-Saharan Africa, including measles, cholera, and neonatal tetanus. Polio and guinea-worm eradication, when achieved, will reduce health costs by eventually eliminating the need for immunization against polio and medication against guinea-worm. If measles eradication becomes a formal global goal, community-level workers will be essential for early disease detection to make eradication possible. If measles is eliminated, cost savings will be significant just as for polio since immunization against measles will not be required.

Some disease outbreaks have enormous potential to reduce economic productivity, as the recent Ebola epidemic has demonstrated and as modelling of the potential impact of a global influenza pandemic has shown. Community health workers visiting all households on a regular basis can detect outbreaks much sooner than facilities in settings in which a high proportion of the population lives more than 3–4 km from a health facility.<sup>68</sup>

As previously mentioned, vital events registration is an essential component of stronger programmes for social and economic development, and their lack throughout sub-Saharan Africa has been a drawback. Community-level workers, particularly now at the dawn of the mHealth revolution, can serve as the foundation for civil registration of vital events and accurate local monitoring of death rates.<sup>68, 69</sup>

Finally, training and utilizing community-level workers is empowering, and it provides the opportunity for increasing family incomes in settings where there are high levels of poverty. These benefits are even more pronounced for women who become community-level workers. Since the number of community-level workers who need to be trained and paid is large (on the order of 1 million people in sub-Saharan Africa), the broader societal benefits for this investment in human capital formation are substantial.

One recent estimate is that the return on investment in community-level health workers could be as high as 10:1,<sup>70</sup> based on an estimated annual cost of maintaining scaled-up community health worker programmes in sub-Saharan Africa of US\$ 2.1 billion and the cost savings achieved (a total of US\$ 21.7 billion, including US\$ 19.4 billion from increased productivity in a healthier population, US\$ 750 million in economic losses per year from improved capacity to control disease outbreaks, and US\$ 1.6 billion from the socioeconomic benefits of increased employment).

## **VIII. Investing in health and in human resources for health in Africa: current status**

In April 2001, all of the 47 heads of state of African Union countries met and pledged to set a target of allocating 15% of their annual budget to improve the health sector. Ten years later, only one of the 38 members of the Africa Union had achieved that target – the United Republic of Tanzania. Twenty-six countries have increased their percentage of government expenditures for health, but 11 countries have reduced their expenditures and another nine countries had not changed.<sup>71</sup> According to the WHO Global Health Expenditure Database's most recently available data,<sup>72</sup> the median percentage of the national government spending for health in Africa is 10.7%. On the basis of information available in 2011, the median level of real per capita government spending from domestic sources on health increased only slightly, from US\$ 9.30 to US\$ 13.40 since 2001. And the governments of 33 countries in 2009 were spending less than US\$ 33 per capita on health.<sup>71</sup>

The Taskforce on Innovative International Financing for Health Systems reported in 2009 that low-income countries need to spend approximately US\$ 50 per capita in order to achieve the health-related MDGs.<sup>73</sup> At this level of investment, the Taskforce estimated that 5 million deaths would be averted each year – 4.3 million newborn and child deaths, 259,000 maternal deaths, 235,000 deaths from tuberculosis, and 177,000 deaths from HIV.<sup>73</sup> More recently, a task force assembled by the Royal Institute of International Affairs has proposed that each country commit to spend 5% of its GDP on health and move progressively towards this goal, and that every government should commit to spend at least US\$ 86 per capita for health services, recognizing that the poorest countries will need external support to achieve this goal.<sup>74</sup>

## **IX. The growing availability of funds for health care in Africa**

We know that as per capita GDP increases, the percentage of the GDP spent on health care also increases, leading to exponentially rapid growth in health care spending in low-income countries whose economies are growing (see Figure 6). This has been referred to as the “First law of health economics” and is partly due to the Baumol effect, which states that labour costs rise in certain segments of the market – most notably in health care services, education and the arts – because productivity gains are hard to achieve. The correlation is so strong, with a correlation coefficient of 0.94, that other explanatory variables have little to add.<sup>4</sup> But we also know that the health status of countries varies greatly at the same level of health expenditure, so the way in which these funds are spent holds great importance. But the strong correlation between overall spending for health and per capita GDP does not necessarily mean that government spending will increase at a similar rate as overall spending in the country. There are wide variations in the level of health at similar levels of per capita national health expenditure and per capita GDP, as shown in Figure 7. So the challenge for you as ministers of finance is to invest wisely and avoid unproductive expenditure escalation.

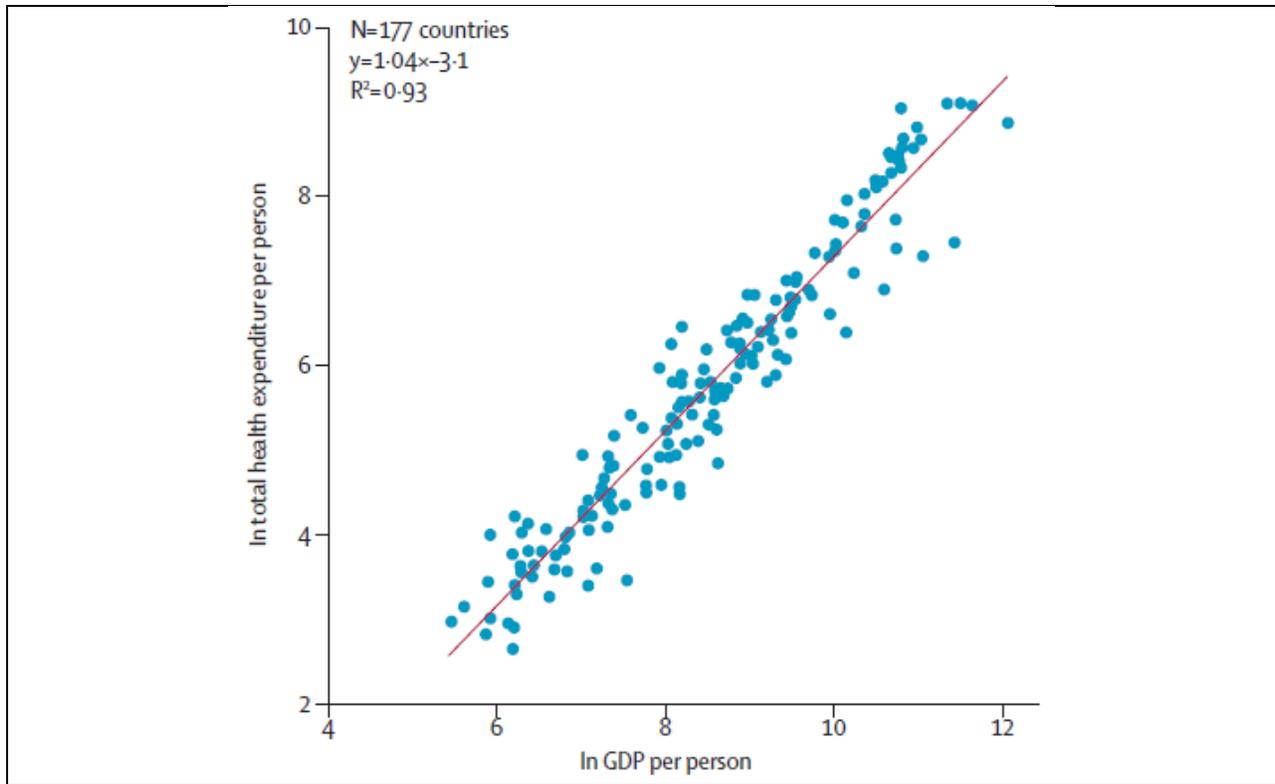


Figure 6. Relation between income and health spending by country<sup>4</sup>

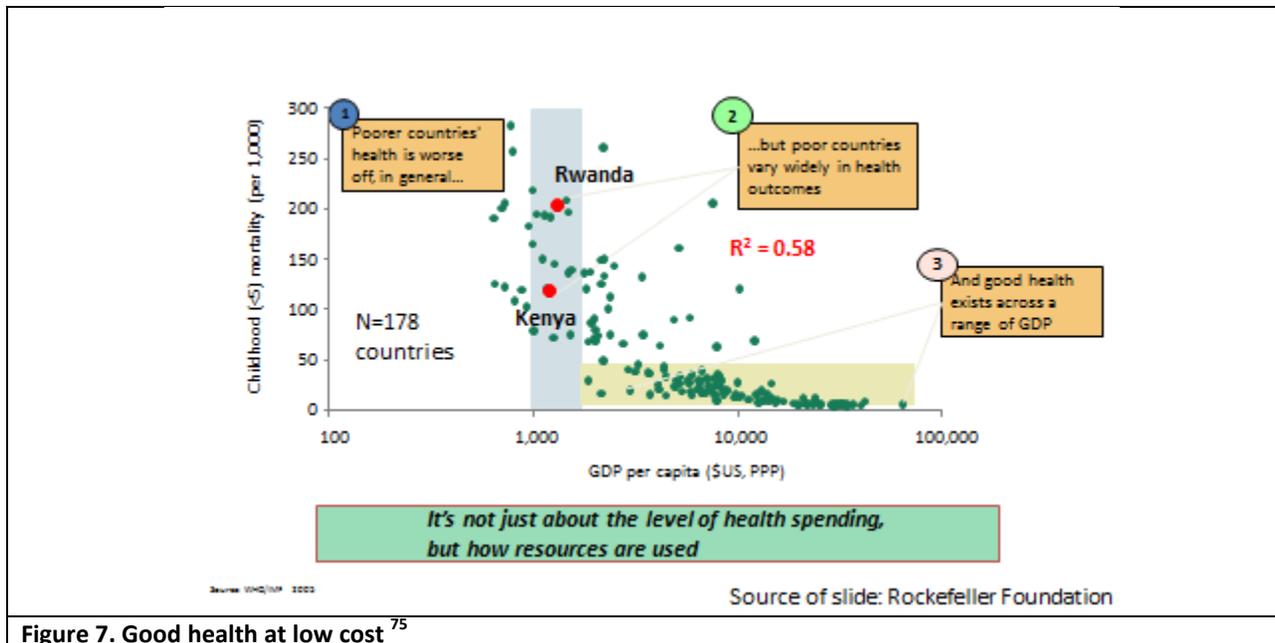


Figure 7. Good health at low cost<sup>75</sup>

The many demands on government budgets create challenges and opportunities. Investing more in the health sector has been difficult because of competing demands from other sectors and because health needs have not been seen as important politically compared to other needs. We believe that addressing

unmet health needs and supporting the expansion of community-based programmes that reach underserved populations are going to receive stronger and stronger political support across sub-Saharan Africa for the foreseeable future. And, as the great disparities in access to health care and in levels of health are becoming more apparent and persistent, growing demands from the standpoint of social justice will be made internally within countries and internationally to address them. Given that Africa as a continent is achieving relatively rapid economic growth now and for the foreseeable future, it is safe to conclude that finding the funds to make greater investments in health should not be the issue. The real issue is whether those funds will be used to achieve the greatest possible improvements in population health.

## **X. The unmet health needs in Africa**

Across sub-Saharan Africa, we have inspiring examples of national progress in improving the health, but the stark reality is that there are 3.1 million children younger than 5 years of age are dying in Africa each year,<sup>61</sup> the great majority from readily preventable or treatable conditions: 179,000 women are dying from pregnancy-related causes,<sup>76</sup> again the great majority of which are readily preventable or treatable; HIV/AIDS is still claiming the lives of 1.1 million people in Africa each year; malaria is claiming 528,000 lives (the great majority in children);<sup>77</sup> and tuberculosis is claiming 690,000 lives.<sup>78</sup>

Although the top drivers of the disease burden in most African countries remain communicable, newborn, nutritional and maternal causes such as diarrhoeal diseases, lower respiratory tract infections and protein-energy malnutrition, the disease burden from non-communicable causes such as stroke, depression, diabetes, and ischemic heart disease is increasing, especially among upper-middle-income countries in the region.<sup>79</sup> Road injuries are taking a growing toll. Disabilities, such as those caused by depression, low back pain, HIV/AIDS and malaria, are also producing a larger share of the global burden of disease than in 1990, the last time this type of study was carried out. Undernutrition (such as that produced by sub-optimal breastfeeding and vitamin deficiencies) and household air pollution are among the leading risk factors for premature death and disability in sub-Saharan Africa.<sup>79</sup> Alcohol use, high blood pressure, and smoking are also major contributors to health loss.<sup>79</sup> Only five out of the 47 countries in sub-Saharan Africa are on track to achieve the MDG this year for reducing mortality in children by two-thirds by 2015, and only 14 of the 47 countries are on track to achieve the MDG for reducing maternal mortality by three-quarters.

Although nearly all countries in sub-Saharan Africa are making some progress in improving the health status of their populations, in many cases this progress is uneven, with the poorest segments of the population not sharing to the same degree in the progress that is being made.<sup>80</sup> And, sub-Saharan Africa as a region is not progressing at the same rate as other regions of the world.<sup>80</sup>

Access to basic health care services remains unavailable in practical terms for millions of Africans. In rural areas, large portions of the population live great distances from health facilities that are staffed by professional health workers. In urban areas, even though geographic distance is not a barrier, services that are readily available and affordable for the poor are inadequate to meet the need. One recent

estimate from the International Labour Organization is that 77% of the rural population and 50% of the urban population of Africa have no access to health care.<sup>20</sup>

The population coverage of key essential interventions that we know are important in promoting good health and preventing death remain remarkably low across sub-Saharan Africa. For instance, the median national percentage of mothers who exclusively breastfeed their infant during the first 6 months of life among the countries of sub-Saharan Africa is only 38%.<sup>81</sup> The median national percentage of children in malaria-endemic areas sleeping under an insecticide-treated bednet is 37%;<sup>81, 82</sup> the median national percentage of children with symptoms of pneumonia who are receiving life-saving antibiotics is only 37%;<sup>81</sup> the median national percentage of pregnant women delivered by a trained attendant is only 59%;<sup>81, 82</sup> and the mean national percentage of women with a met need for family planning is only 47%.<sup>81, 82</sup>

Access to quality health services that are affordable and that do not lead to catastrophic expenses (debt from which families cannot recover, often defined as more than 40% of a family's annual income) and severe poverty is an increasingly high priority for poor people. This becomes a greater and greater priority as other basic needs are better met.

Not only are millions of people dying throughout Africa from readily preventable or treatable conditions, and not only are basic and essential service unavailable to millions, but also there is a fundamental lack of trust in health systems in many parts of Africa for many reasons, not the least of which are too many instances in which patients are being treated without adequate respect,<sup>83</sup> asked to pay unofficial fees, or unable to access services because health workers did not report for duty as expected. Often health workers are being asked to work without regular pay, without the supplies and equipment they need, and in unsafe environments. The recent devastating Ebola epidemic brought many of these issues to the forefront of the world's attention.

## **XI. The cost of inaction and opportunity cost on lives saved and disability averted**

The value of greater investments in health among countries in Africa should be obvious. But what are the costs of inaction and what are the opportunity costs on lives saved and disability averted? More than 2 million lives could be saved each year in Africa by implementing proven interventions at high levels of coverage that can be achieved only with community-level human resources – community health workers and trained community midwives. And these investments would yield substantial returns in the social and economic development of countries over and above their direct impact on health.

William Foege, one of the giants of global health of the 20th century, reminds us that:

The most important medical ethical decision is how we allocate resources. This includes planning and administering public health programmes to reduce major causes of mortality, morbidity, disability, and behaviour which reduce the quality of life.<sup>84</sup>

From this perspective, you as ministers of finance of your respective countries collectively hold the lives and well-being of millions of Africans in your hands. The ethical and moral dimension of your decisions cannot be avoided.

## **XII. Brazil, Ethiopia and Rwanda as exemplars of investing in community-level human resources for health<sup>b</sup>**

Exciting progress has been made and can still be made by investing in community-level human resources for health. Here are highlights of three national success stories.

### **The Community Health Agent Programme of Brazil**

The *Programa Saúde da Família* (Family Health Programme, now called the Family Health Strategy and abbreviated PSF) was launched in 1994, building upon several previous decades of experience in rural underserved areas with Community Health Agents (CHAs), who were legally recognized as professionals in 2002. Currently, Brazil has 236,000 CHAs working as part of 33,000 family health care teams (*Equipos de Saúde Familiar*), or 1 CHA for every 600 people approximately. Family health care teams are based within PSF clinics and provide services to usually 600–1,000 families (1,500–3,000 people), but they occasionally serve as many as 4,500 people.

Originally, CHAs provided vertical (centrally directed) maternal and child health services (such as immunizations and family planning) in isolated rural areas where services were limited. These activities have now evolved into the cornerstone of the national primary health care programme that reaches almost the entire population of the country. CHAs operate as members of family health care teams that are managed by municipalities. With usually 4–6 CHAs on each team (but sometimes more), each CHA is responsible for approximately 150 families (ranging from 75 to 200 families). Other members of the family health team include one doctor, one nurse, and one auxiliary nurse.

The scope of work for the health care teams varies from region to region, but most teams provide comprehensive care through promotive, preventive, recuperative, and rehabilitative services. CHAs register the households in the areas where they work and are also expected to empower their communities and link them to the formal health system.

CHAs are full-time salaried workers earning in the range of US\$ 100 to US\$ 228 per month. They are supervised by nurses and physicians from the local health centre. Supervisory nurses spend 50% of their time in these supervisory roles and the rest of the time working in the health centre. Key services provided by CHAs include: the promotion of breastfeeding; the provision of prenatal, neonatal, and child care; the provision of immunizations; and participation in the management of infectious diseases, such as screening for and providing treatment for HIV/AIDS and TB.

---

<sup>b</sup> These case studies are taken from a fuller description (with appropriate references),<sup>85</sup> which also includes descriptions of other large-scale community health worker programmes around the world.

In the 1990s, CHAs were trained to provide integrated management of childhood illness (IMCI) in the home, including providing prescriptions for antibiotics for children suspected of having pneumonia. CHAs are closely integrated into formal health services.

The financing of the health system in Brazil is decentralized and arises from a variety of funding sources, including taxes, social contributions, out-of-pocket expenditures, and employer health insurance purchases. The PSF provides services free of charge to recipients, and the programme is financed on a capitation basis with incentives for municipalities to increase coverage. Since 1996, states and municipalities have been responsible for the management and financing of health care. Now, states must allocate at least 12% of their total budget to health; municipal governments are required to spend 15% of their total budget on health—a requirement met by 98% of municipalities.

Other significant cadres of community health workers in Brazil include those trained and supported by the Catholic NGO Pastorate of the Child. This NGO has a network of 260,000 volunteer community health workers who promote child survival through low-technology interventions such as the administration of oral rehydration solution for childhood diarrhoea.

Brazil has experienced dramatic improvements in a broad range of national health indicators over the past three decades, and much of this progress is attributable to the strength of its primary health care programme and the critical role played by CHAs.

### **Ethiopia's Health Extension Programme**

The first cadre of Health Extension Workers (HEWs) was trained in 2004. In the following years, Ethiopia expanded its primary health care programme in hope of achieving universal health coverage. Human resources that serve at the community level in Ethiopia include: HEWs, voluntary community health workers, and Community Health Promoters, now called Health Development Army (HDA) Volunteers.

At present there are approximately 38,000 HEWs (1 for approximately 2,500 people). The percentage of the population that is served by the programme has increased from 61% in 2003 to 87% in 2007. HEWs are supposed to split their time between health posts and the community. The HDA Volunteers' role is to increase utilization of primary health services through part-time work (less than 2 hours per week) within their communities. Each HEW serves approximately 2,500 people, and each HDA volunteer is responsible for 25 people.

The Health Sector Development Plan (HSDP) has been financed by national and sub-national government entities, bilateral and multilateral donors, NGOs, private contributions, and user-fee revenues. Current HSDP funders include the GAVI Alliance's Health System Strengthening Programme; the Global Fund to Fight AIDS, Tuberculosis and Malaria; and the Carter Center, among others.

The costs of HEWs are as follows: US\$ 234 for 1 month of training; US\$ 178 for the apprenticeship; and US\$ 84 monthly for the salary of one HEW. At the local level, financing and planning are decentralized and the *woredas* (districts) receive block grants to cover the expenses of the HEP.

The main responsibilities of HEWs include health promotion, disease prevention, and treatment of uncomplicated and non-severe illnesses, such as cases of malaria, pneumonia, diarrhoea, and malnutrition in the community. Selected HEWs do community-based insertion of contraceptive implants. Most HEWs provide oral contraceptive pills and condoms and give injectable contraception to clients. HEWs are a formally recognized cadre that has strong political support, including from the Federal Ministry of Health and the prime minister. HEWs provide training and support to HDA Volunteers, who in turn refer clients to them.

The role of HDA Volunteers is to promote healthy behaviours at the household level and increase utilization of primary health services. Their services include prevention, health promotion, and health education; support for HEWs and their outreach work; and support of and participation in intermittent campaign-type activities.

HEWs are formal government employees and are paid a salary. HDA Volunteers are not monetarily compensated, but receive non-financial incentives such as formal recognition, ongoing mentorship, certificates, and recognition at community celebrations.

Supervision is conducted by the *woreda* supervisory team, which consists of a health officer, a public health nurse, an environmental/hygiene expert, and a health education expert. In addition, each health centre supervises approximately five health posts (with 10 HEWs), and supervision occurs in the health post and at the health centre. In 2005, HEWs had an average of three supervisory visits over the course of 9 months. HDA Volunteers are supervised by HEWs.

The Ethiopian health system is decentralized and has been reorganized into three tiers. Tier 1 is made up of primary health care units comprising a health centre (one health centre for 15,000–25,000 people) and five satellite health posts (one health post for 3,000–5,000 people) along with *woreda* hospitals, each serving 60,000–100,000 people. Tier 2 includes zonal/general hospitals (one hospital for 1 million to 1.5 million people). And Tier 3 involves specialized/referral hospitals (one hospital for 3.5 million to 5 million people).

Ethiopia is making some of the strongest improvements in health in all of Africa at present. Its declines in under-5 mortality and in maternal mortality, along with dramatic improvements in the contraceptive prevalence rate, are among the most notable in all of Africa. HEWs are widely seen as the main reason that services have expanded and that these results have been achieved. Significant, positive associations have been found between exposure to HEWs and child vaccination uptake, insecticide-treated bednet use by children and pregnant women, utilization of antenatal care early in pregnancy, and proper sanitary practices. Additionally, some regions have achieved increases in institutional deliveries and tetanus vaccination coverage.

## **Rwanda**

The Rwanda community health worker programme was established in 1995, aiming at increasing uptake of essential maternal and child clinical services through education of pregnant women, promotion of healthy behaviours, and follow-up and linkages to health services. An estimated 60,000 community

health workers (1 for every 200 people approximately) operating at the village level provide the first line of health service delivery. There are three community health workers in each village: a male–female pair (called *Binômes*) providing basic care and integrated community case management (iCCM) of childhood illness, and a community health worker in charge of maternal health, called an ASM (*Agent de Sante Maternelle*).

When the Ministry of Health endorsed the programme in 1995, there were approximately 12,000 community health workers. By 2005, the programme had grown to over 45,000 community health workers (30,000 working as *Binômes* and 15,000 ASMs). From 2005, after the Government's decentralization policy had been implemented nationally, the Ministry of Health increased efforts to improve maternal and child health services, and between 2008 and 2011, Rwanda introduced iCCM of childhood illness (for childhood pneumonia, diarrhoea, and malaria). In 2010, the Government of Rwanda introduced family planning as a component of the national community health policy.

Three community health workers, each with clearly distinct defined roles and responsibilities, operate in each village of approximately 100–150 households. The ASM identifies pregnant women, makes regular home follow-up visits during and after pregnancy, and ensures deliveries in health facilities where skilled health workers are available. *Binômes* provide iCCM (assessment, classification, and treatment or referral of diarrhoea, pneumonia, malaria, and malnutrition in children younger than 5 years of age), community-based provision of contraceptives, directly observed treatment (DOT) for TB, prevention of non-communicable diseases, and preventive and behaviour change activities.

Although community health workers in Rwanda are volunteers, in 2009 the Ministry of Health introduced community performance-based financing (CBPF) as a way to motivate community health workers. Community health worker cooperatives are organized groups of community health workers that receive and share funds from the Ministry of Health based on the achievement of specific targets established by the Ministry. By linking incentives to performance, the Ministry hopes to improve quality and utilization of health services.

Cell Coordinators (also referred to as the In-Charge of Community Health Workers at the local health centre), sometimes assisted by an Assistant Cell Coordinator, visit community health workers to monitor activities, monitor supplies and drugs, compile reports from community health workers, and submit the information to the In-Charge of Community Health on a quarterly basis. As part of this supervision, Cell Coordinators also make home visits to see how the community health workers are performing their activities and verify reports that have been sent by community health workers using mobile phone text messaging to the health centre. In addition to this line of supervision, the community health worker cooperatives also perform an evaluative function, and community health workers are incentivized based on the performance of the cooperative.

Rwanda's health system financing originates from two main sources. On the supply side, the central treasury transfers funds to districts and health facilities. On the demand side, the system provides health insurance payments for documented services. In recent years, much of the total health expenditures of the Government of Rwanda have come from external sources such as the Global Fund

to Fight AIDS, Tuberculosis and Malaria; PEPFAR (the President's Emergency Plan for AIDS Relief); and the President's Malaria Initiative. In 2011, 47% of the government's total health expenditure (US\$ 407 million) was supplied by donors.

However, the Government of Rwanda has increased its own spending on essential health services since 2005; spending is projected to reach 15% of the government's total budget by 2015. Community-based health insurance schemes have allowed for 92% of the population to be insured. This has greatly increased access to health care service and drugs.

Rwanda achieved its MDGs for maternal and child health in 2012, three years ahead of schedule. Its community health worker programme has played an important role in expanding coverage of basic services, particularly community-based family planning services and treatment of childhood malaria and pneumonia.

### **XIII. Concluding comments**

The opportunity of what is now being called a "grand convergence" of major gains over the next 20 years in reductions in the prevalence of serious infectious diseases, in child and maternal mortality, in the incidence and consequences of non-communicable diseases and injuries, and in the achievement of universal health coverage is now within our reach.<sup>4</sup> Increased domestic financing will be needed to achieve this "grand convergence," and in most countries economic growth will create the fiscal space for increased domestic spending on health.

The Third Global Forum on Human Resources for Health, composed of representatives of governments and a diverse group of multilateral, bilateral and academic institutions, met in Recife, Brazil in 2013, and made the following statement:

The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being, without distinction of race, religion, political belief or economic or social condition. Poor health is one of the root causes of vulnerability and poverty, while in turn poverty, inequality and social exclusion further contribute to ill health. Healthy populations and well-performing national health systems are fundamental for equitable, inclusive, sustainable development.<sup>86</sup>

We are now at a tipping point for health in Africa: greater investments now community-level health programmes will help countries create a new foundation for health systems that will accelerate progress in reducing the number of preventable deaths, in controlling diseases, in accessing basic health services and higher levels of care in the health system, in identifying disease outbreaks early on, and promoting socioeconomic development more broadly. Building strong national community-level programmes also requires strengthening the primary health care system more broadly, since community-level workers need trainers, supervisors, and support for drugs and supplies. And when patients develop medical problems that community-level workers cannot handle, they need to be able to promptly refer their patients to the next higher level of care and to assure their patients that they will be treated with dignity and quality.

Not only do we need a larger health workforce, but we also need the right mix of health workers. And those at the higher levels need to be heavily engaged in training and supervising those at lower levels, and in “task shifting/task sharing” in order to maximize the efficiency of the existing health workforce and extend its reach to outlying areas. We also need to nurture those who are currently in the health workforce and create suitable conditions of employment for them too so that they are better motivated and more productive, thereby reducing turnover and departure from the workforce.

N. R. E. Fendall was one of the great pioneers of primary health care and a champion of a strong community-level health workforce in Africa during the 20th century. Four decades ago he wrote the following poignant statement:

If I were asked to compose an epitaph on medicine throughout the 20th century it would read: “Brilliant in its scientific discoveries, superb in its technological breakthroughs, but woefully inept in its application to those most in need.”<sup>87</sup>

Let us all strive to assure that in the 21st century those most in need in Africa will not continue to be forgotten.

## Acknowledgements

The authors are grateful to Rachel Strodel for research assistance.

## References

1. World Health Organization, UNICEF. Declaration of Alma-Ata. International Conference on Primary Health Care, 6-12 September 1978; 1978; Alma-Ata, USSR: World Health Organization; 1978.  
[http://www.who.int/publications/almaata\\_declaration\\_en.pdf](http://www.who.int/publications/almaata_declaration_en.pdf)
2. Chan M, Lake A. Towards ending preventable child deaths. *Lancet* 2012; **379**(9832): 2119-20.
3. Glass RI, Guttmacher AE, Black RE. Ending preventable child death in a generation. *Jama* 2012; **308**(2): 141-2.
4. Jamison DT, Summers LH, Alleyne G, et al. Global health 2035: a world converging within a generation. *Lancet* 2013; **382**(9908): 1898-955.
5. Sen A. Development as Freedom. Oxford: Oxford University Press; 1999.
6. OECD. OECD Health Statistics 2014: How does the United States compare? . 2014.  
<http://www.oecd.org/unitedstates/Briefing-Note-UNITED-STATES-2014.pdf> (accessed 3 July 2015).
7. Sachs JD. Macroeconomics and Health: Investing in Health for Human Development. Geneva: World Health Organization, 2001.
8. Taylor CE, Newman JS, Kelly NU. The child survival hypothesis. *Population studies* 1976; **30**(2): 263-78.
9. World Bank. World Development Report 1993: Investing in Health. Washington, DC: World Bank, Oxford University Press; 1993.
10. UNDP. Socio-economic Impact of Ebola in West Africa. 2015.  
<http://www.africa.undp.org/content/rba/en/home/library/reports/socio-economic-impact-of-the-ebola-virus-disease-in-west-africa.html> (accessed 13 July 2015).
11. Wright S, Hanna L. A Wake-up Call: Lessons from Ebola for the World's Health Systems 2015.  
<http://www.savethechildren.org/atf/cf/%7B9def2ebe-10ae-432c-9bd0-df91d2eba74a%7D/WAKE%20UP%20CALL%20REPORT%20PDF.PDF> (accessed 17 March 2015).
12. Stenberg K, Axelson H, Sheehan P, et al. Advancing social and economic development by investing in women's and children's health: a new Global Investment Framework. *Lancet* 2014; **383**(9925): 1333-54.

13. WHO. Working Together for Health: The World Health Report 2006. Geneva: World Health Organization; 2006. <http://www.who.int/whr/2006/en/>.
14. UN General Assembly. Resolution on Global Health and Foreign Policy 2012. [http://ncdalliance.org/sites/default/files/resource\\_files/Global%20Health%20and%20Foreign%20Policy%20resolution%202012\\_67th%20GA.pdf](http://ncdalliance.org/sites/default/files/resource_files/Global%20Health%20and%20Foreign%20Policy%20resolution%202012_67th%20GA.pdf) (accessed 30 June 2015).
15. GHWA. Global Strategy on Human Resources for Health: Workforce 2030 (document in preparation). Geneva: Global Health Workforce Alliance and World Health Organization; 2015.
16. Dussault G, Dubois CA. Human resources for health policies: a critical component in health policies. *Human resources for health* 2003; **1**(1): 1.
17. Chen L, Evans T, Anand S, et al. Human resources for health: overcoming the crisis. *Lancet* 2004; **364**(9449): 1984-90.
18. UN. The Road to Dignity by 2030: Ending Poverty, Transforming All Lives and Protecting the Planet Synthesis Report of the Secretary-General On the Post-2015 Agenda 2014. [http://www.un.org/disabilities/documents/reports/SG\\_Synthesis\\_Report\\_Road\\_to\\_Dignity\\_by\\_2030.pdf](http://www.un.org/disabilities/documents/reports/SG_Synthesis_Report_Road_to_Dignity_by_2030.pdf) (accessed 30 June 2015).
19. Arcand J, EC A, Menkulasic G, Weber SA. Health sector employment, health care expenditure and economic growth: what are the associations? (forthcoming). Washington, DC: The World Bank; 2015.
20. Scheil-Adlung X. Global evidence on inequities in rural health protection. New data on rural deficits in health coverage for 174 countries. Geneva: International Labour Office; 2015. <http://www.social-protection.org/gimi/gess/RessourcePDF.action?ressource.ressourceid=51297>.
21. Perry HB, Zulliger R, Rogers MM. Community Health Workers in Low-, Middle-, and High-Income Countries: An Overview of Their History, Recent Evolution, and Current Effectiveness. *Annual review of public health* 2014; **35**: 399-421.
22. Singh P, Chokshi DA. Community health workers--a local solution to a global problem. *N Engl J Med* 2013; **369**(10): 894-6.
23. Prata N, Vahidnia F, Potts M, Dries-Daffner I. Revisiting community-based distribution programs: are they still needed? *Contraception* 2005; **72**(6): 402-7.
24. Perry H, Christian M, Friberg I. How Many Lives of Mothers and Children Could Be Averted by Strengthening Community-based Primary Health Care? An Analysis Using the Lives Saved (LiST) Tool. Manuscript under review; 2015.
25. Ahmed S, Li Q, Liu L, Tsui AO. Maternal deaths averted by contraceptive use: an analysis of 172 countries. *Lancet* 2012.
26. Rutstein SO. Effects of preceding birth intervals on neonatal, infant and under-five years mortality and nutritional status in developing countries: evidence from the demographic and health surveys. *Int J Gynaecol Obstet* 2005; **89** Suppl 1: S7-24.
27. Cleland J, Conde-Agudelo A, Peterson H, Ross J, Tsui A. Contraception and health. *Lancet* 2012; **380**(9837): 149-56.
28. Fabic MS, Choi Y, Bongaarts J, et al. Meeting demand for family planning within a generation: the post-2015 agenda. *Lancet* 2015; **385**(9981): 1928-31.
29. Copenhagen Consensus Center. Copenhagen Consensus 2012: Outcomes. 2012. <http://www.copenhagenconsensus.com/copenhagen-consensus-iii/outcome> (accessed 9 July 2015).
30. Homer CS, Friberg IK, Dias MA, et al. The projected effect of scaling up midwifery. *Lancet* 2014; **384**(9948): 1146-57.
31. Renfrew MJ, McFadden A, Bastos MH, et al. Midwifery and quality care: findings from a new evidence-informed framework for maternal and newborn care. *Lancet* 2014; **384**(9948): 1129-45.
32. Mahapatra P, Shibuya K, Lopez AD, et al. Civil registration systems and vital statistics: successes and missed opportunities. *Lancet* 2007; **370**(9599): 1653-63.
33. Setel PW, Macfarlane SB, Szreter S, et al. A scandal of invisibility: making everyone count by counting everyone. *Lancet* 2007; **370**(9598): 1569-77.
34. World Health Organization. The World Health Report 2008. Primary Health Care -- Now More Than Ever. 2008. <http://www.who.int/whr/2008/en/> (accessed 1 July 2015).
35. Ministry of Health of Ghana. A Primary Health Care Strategy for Ghana. Accra, Ghana: Ministry of Health of Ghana, 1978.
36. Fredericksen HS. Epidemographic Surveillance. In: Fredericksen HS, Dunn FL, eds. Epidemographic Surveillance: A Symposim. Chapel Hill, NC: Carolina Population Center; 1971.
37. Buor D. Analysing the primacy of distance in the utilization of health services in the Ahafo-Ano South district, Ghana. *Int J Health Plann Manage* 2003; **18**(4): 293-311.
38. Gabrysch S, Campbell OM. Still too far to walk: literature review of the determinants of delivery service use. *BMC Pregnancy Childbirth* 2009; **9**: 34.
39. McLaren ZM, Ardington C, Leibbrandt M. Distance decay and persistent health care disparities in South Africa. *BMC Health Serv Res* 2014; **14**: 541.
40. Tanser F, Gijsbertsen B, Herbst K. Modelling and understanding primary health care accessibility and utilization in rural South Africa: an exploration using a geographical information system. *Soc Sci Med* 2006; **63**(3): 691-705.
41. Hounton S, Newlands D. Applying the net-benefit framework for analyzing and presenting cost-effectiveness analysis of a maternal and newborn health intervention. *PLoS ONE* 2012; **7**(7): e40995.
42. Hounton S, Newlands D. Applying the net-benefit framework for assessing cost-effectiveness of interventions towards universal health coverage. *Cost effectiveness and resource allocation : C/E* 2012; **10**(1): 8.

43. Prost A, Colbourn T, Seward N, et al. Women's groups practising participatory learning and action to improve maternal and newborn health in low-resource settings: a systematic review and meta-analysis. *Lancet* 2013; **381**(9879): 1736-46.
44. Lassi ZS, Haider BA, Bhutta ZA. Community-Based Intervention Packages for Preventing Maternal Morbidity and Mortality and Improving Neonatal Outcomes. International Initiative for Impact Evaluation (3ie); 2010.
45. Freeman P, Perry HB, Gupta SK, Rassekh B. Accelerating progress in achieving the millennium development goal for children through community-based approaches. *Glob Public Health* 2009: 1-20.
46. Haines A, Sanders D, Lehmann U, et al. Achieving child survival goals: potential contribution of community health workers. *Lancet* 2007; **369**(9579): 2121-31.
47. Black RE, Victora CG, Walker SP, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet* 2013; **382**(9890): 427-51.
48. Black RE, Allen LH, Bhutta ZA, et al. Maternal and child undernutrition: global and regional exposures and health consequences. *Lancet* 2008; **371**(9608): 243-60.
49. Davis T, Wetzel C, Hernandez Avilan E, et al. Reducing child global undernutrition at scale in Sofala Province, Mozambique, using Care Group Volunteers to communicate health messages to mothers. *Global Health: Science and Practice* 2013; **1**(1): 35-51.
50. Cates W, Jr. Family planning: the essential link to achieving all eight Millennium Development Goals. *Contraception* 2010; **81**(6): 460-1.
51. Cates W, Jr., Abdool Karim Q, El-Sadr W, et al. Global development. Family planning and the Millennium Development Goals. *Science* 2010; **329**(5999): 1603.
52. Kristof N, WuDunn S. Half the Sky: Turning Oppression into Opportunity for Women Worldwide. New York: Vintage Books; 2009.
53. Cleland J, Harbison S, Shah IH. Unmet need for contraception: issues and challenges. *Stud Fam Plann* 2014; **45**(2): 105-22.
54. Olawo A, Bashir I, Solomon M, Stanback J, Ndugga B, Malonza I. "A cup of tea with our CBD agent...": community provision of injectable contraceptives in Kenya is safe and feasible. *Global Health: Science and Practice*; **1**(287-288).
55. Gallo MF, Walldorf J, Kolesar R, et al. Evaluation of a volunteer community-based health worker program for providing contraceptive services in Madagascar. *Contraception* 2013; **88**(5): 657-65.
56. Abdul-Hadi RA, Abass MM, Aiyenigba BO, et al. The effectiveness of community based distribution of injectable contraceptives using community health extension workers in Gombe State, Northern Nigeria. *African journal of reproductive health* 2013; **17**(2): 80-8.
57. Stanback J, Mbonye AK, Bekiita M. Contraceptive injections by community health workers in Uganda: a nonrandomized community trial. *Bull World Health Organ* 2007; **85**(10): 768-73.
58. Chin-Quee D, Bratt J, Malkin M, et al. Building on safety, feasibility, and acceptability: the impact and cost of community health worker provision of injectable contraception. *Global Health: Science and Practice* 2013; **1**(3): 316-27.
59. Olson DJ, Piller A. Ethiopia: an emerging family planning success story. *Stud Fam Plann* 2013; **44**(4): 445-59.
60. Lehmann U, Friedman I, Sanders D. Review of the Utilisation and Effectiveness of Community-based Health Workers in Africa. South Africa: University of Western Cape, South Africa SEED Trust, South Africa, 2004.  
<http://hrh.uwc.ac.za/index.php?module=hrhlibrary&action=downloadfile&fileid=111930420852115> (accessed 13 July 2014).
61. UNICEF. The State of the World's Children 2015: Reimagine the Future. Innovation for Every Child. New York: UNICEF; 2014. <http://sowc2015.unicef.org/> (accessed 13 July 2014).
62. Perry H. A brief history of community health programs. In: Perry H, Crigler L, editors. Developing and Strengthening Community Health Worker Programs at Scale: A Reference Guide and Case Studies for Program Managers and Policy Makers. Washington, DC: USAID/MCHIP; 2014.  
[http://www.mchip.net/sites/default/files/MCHIP\\_CHW%20Ref%20Guide.pdf](http://www.mchip.net/sites/default/files/MCHIP_CHW%20Ref%20Guide.pdf) (accessed 13 July 2014).
63. Lehmann U, Sanders D. Community health workers: What do we know about them? The state of the evidence on programmes, activities, costs and impact on health outcomes of using community health workers. Geneva: World Health Organization, 2007.
64. Perry HB, Zulliger R. 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 Goals 2012.  
[http://www.coregroup.org/storage/Program\\_Learning/Community\\_Health\\_Workers/review%20of%20chw%20effectiveness%20for%20mdgs-sept2012.pdf](http://www.coregroup.org/storage/Program_Learning/Community_Health_Workers/review%20of%20chw%20effectiveness%20for%20mdgs-sept2012.pdf) (accessed 1 July 2015).
65. Bhutta Z, Lassi ZS, Pariyo G, Huicho L. Global Experience of Community Health Workers for Delivery of Health Related Millennium Developmental Goals: A Systematic Review, Country Case Studies, and Recommendations for Integration into National Health Systems. Geneva, Switzerland: World Health Organization, Global Health Workforce Alliance; 2010.
66. Kabide S. Concluding Comments: Conference on Enhancing Community Health Worker Systems at Scale in Sub-Saharan Africa, Accra, Ghana, 9-11 June 2015. Accra, Ghana; 2015.

67. Wandwalo E, Robberstad B, Morkve O. Cost and cost-effectiveness of community based and health facility based directly observed treatment of tuberculosis in Dar es Salaam, Tanzania. *Cost effectiveness and resource allocation* 2005; **3**: 6.
68. Perry H, Dhillon R, Liu A, et al. Strong national community health worker programs: One of the key resources for improving global health security post-Ebola, for future outbreak surveillance, and for health systems strengthening. Manuscript under review for publication; 2015.
69. Munos M, Koffi A, Sangho H, et al. Strengthening community networks for vital event reporting: community volunteer reporting of vital events in rural Mali *PLoS ONE* (forthcoming, June 2015).
70. Tamire Woldemarian A, Perry H, Maeda A, et al. Strengthening Primary Health Care through Community Health Workers: Investment Case and Financing Recommendations. New York Office of the UN Special Envoy for Health MDG Financing and Malaria; 2015.
71. WHO. The Abuja Declaration: Ten Years On 2011. [http://www.who.int/healthsystems/publications/abuja\\_report\\_aug\\_2011.pdf](http://www.who.int/healthsystems/publications/abuja_report_aug_2011.pdf) (accessed 30 June 2015).
72. WHO. Global Health Expenditure Database. 2015. <http://apps.who.int/nha/database/Select/Indicators/en> (accessed 9 July 2015).
73. Taskforce on Innovative International Financing for Health Systems. More money for health, and more health for the money. London, England: International Health Partnership; 2009. [http://www.internationalhealthpartnership.net/fileadmin/uploads/ihp/Documents/Results\\_\\_\\_Evidence/HAE\\_\\_\\_results\\_\\_\\_lessons/Taskforce\\_report\\_EN.2009.pdf](http://www.internationalhealthpartnership.net/fileadmin/uploads/ihp/Documents/Results___Evidence/HAE___results___lessons/Taskforce_report_EN.2009.pdf) (accessed 13 July 2014).
74. Centre on Global Health Security Working Group. Shared Responsibilities for Health: A Coherent Framework for Health Financing. Final Report of the Centre on Global Health Security Working Group: Chatham House, the Royal Institute of International Affairs; 2014. [http://www.chathamhouse.org/sites/files/chathamhouse/field/field\\_document/20140521HealthFinancing.pdf](http://www.chathamhouse.org/sites/files/chathamhouse/field/field_document/20140521HealthFinancing.pdf) (accessed 13 July 2014).
75. Pablos-Mendez A. 2009. The Transformation of Health Systems. Presentation at Johns Hopkins University, Baltimore, Maryland.
76. WHO, UNICEF, UNFPA, Bank W. Trends in Maternal Mortality: 1990 to 2013. Geneva: World Health Organization; 2014. [http://apps.who.int/iris/bitstream/10665/112697/1/WHO\\_RHR\\_14.13\\_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/112697/1/WHO_RHR_14.13_eng.pdf?ua=1) (accessed 13 July 2014).
77. WHO. World Malaria Report 2014. Geneva: WHO Global Malaria Programme; 2014. [http://www.who.int/malaria/publications/world\\_malaria\\_report\\_2014/wmr-2014-no-profiles.pdf?ua=1](http://www.who.int/malaria/publications/world_malaria_report_2014/wmr-2014-no-profiles.pdf?ua=1) (accessed 13 July 2014)
78. WHO. Global Tuberculosis Report 2014. Geneva: World Health Organization; 2014. [http://apps.who.int/iris/bitstream/10665/137094/1/9789241564809\\_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/137094/1/9789241564809_eng.pdf?ua=1) (accessed 13 July 2014).
79. World Bank. The Global Burden of Disease: Main Findings for Sub-Saharan Africa. 2013. <http://www.worldbank.org/en/news/feature/2013/09/09/global-burden-of-disease-findings-for-sub-saharan-africa> (accessed 30 June 2015).
80. United Nations. The Millennium Development Goals Report 2014. New York, NY: United Nations; 2014. p. 68. <http://www.un.org/millenniumgoals/2014%20MDG%20report/MDG%202014%20English%20web.pdf> (accessed 13 July 2014).
81. UNICEF, WHO. Countdown to 2015. Fulfilling the Health Agenda for Women and Children: the 2014 Report. 2014. [http://www.countdown2015mnch.org/documents/2014Report/Countdown\\_to\\_2015-Fulfilling%20the%20Health\\_Agenda\\_for\\_Women\\_and\\_Children-The\\_2014\\_Report-Conference\\_Draft.pdf](http://www.countdown2015mnch.org/documents/2014Report/Countdown_to_2015-Fulfilling%20the%20Health_Agenda_for_Women_and_Children-The_2014_Report-Conference_Draft.pdf) (accessed 1 July 2015).
82. UNICEF. Country Profiles: Maternal, Newborn and Child Survival. Division of Policy and Practice, Statistics and Monitoring Section. 2012. <http://www.data.unicef.org/resources/maternal-health-country-profiles> (accessed 13 July 2015).
83. Bohren MA, Vogel JP, Hunter EC, et al. The Mistreatment of Women during Childbirth in Health Facilities Globally: A Mixed-Methods Systematic Review. *PLoS Med* 2015; **12**(6): e1001847.
84. Foege W. Morality, Ethics and Public Health: The Four Premises of Public Health, nd
85. Perry H, Zulliger R, Scott K, et al. Case Studies of Large-Scale Community Health Worker Programs: Examples from Afghanistan, Bangladesh, Brazil, Ethiopia, India, Indonesia, Iran, Nepal, Pakistan, Rwanda, Zambia and Zimbabwe. In: Perry H, Crigler L, editors. Developing and Strengthening Community Health Worker Programs at Scale: A Reference Guide and Case Studies for Program Managers and Policymakers. Washington, DC: USAID and MCHIP (Maternal and Child Health Integrated Program); 2014. [http://www.mchip.net/sites/default/files/mchipfiles/17a\\_AppA-Case%20Studies.pdf](http://www.mchip.net/sites/default/files/mchipfiles/17a_AppA-Case%20Studies.pdf) (accessed 13 July 2014).
86. 3rd Global Forum on Human Resources for Health. The Recife Political Declaration on Human Resources for Health: renewed commitments towards universal health coverage. 2013. [http://www.who.int/workforcealliance/forum/2013/recife\\_declaration\\_17nov.pdf?ua=1](http://www.who.int/workforcealliance/forum/2013/recife_declaration_17nov.pdf?ua=1) (accessed 30 June 2015).
87. Fendall NR. Auxiliaries and primary medical care. *Bulletin of the New York Academy of Medicine* 1972; **48**: 1291-300.