

IMPROVING HEALTH SYSTEM EFFICIENCY

ETHIOPIA

Human resources for health reforms

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Catriona Waddington



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BACKGROUND AND CONTEXT

1.1 The case study

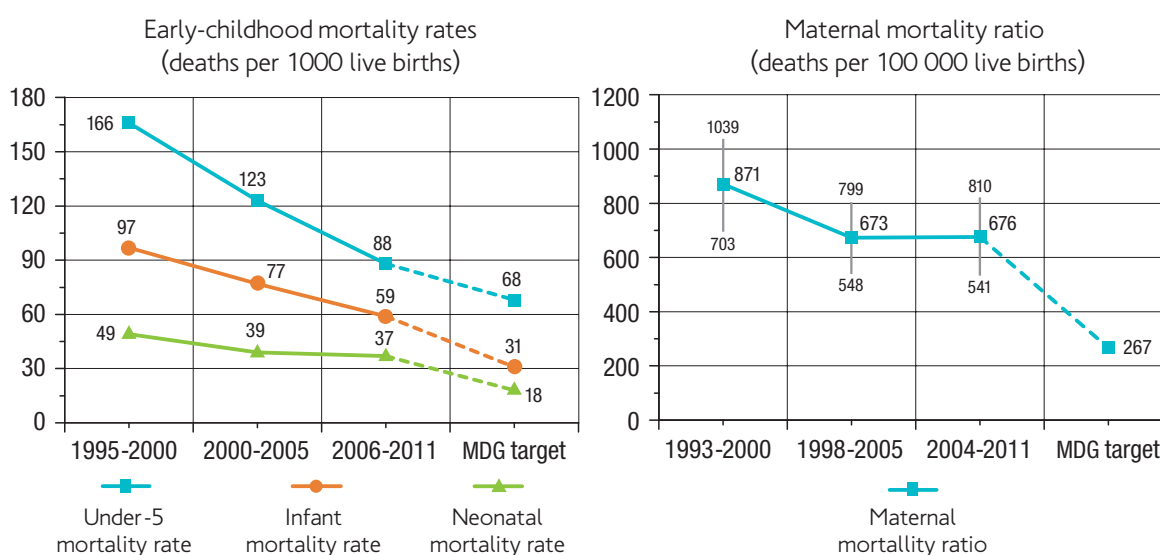
This study documents the achievements and challenges of three major reforms in the area of human resources for health in Ethiopia, which involve:

- creating a new cadre, designated health extension workers (HEW),¹ to accelerate progress towards universal coverage of community-level health services;
- task shifting and scaling up the production of mid-level health professionals to meet the human resource requirements for the accelerated expansion of primary healthcare units; and
- increasing the production and competencies of general-practice physicians through an expansion of medical schools and a reform of medical school curricula to address a critical shortage of medical doctors in the country.

1.1.1 Health profile

The health sector in Ethiopia has shown remarkable progress involving a number of health, nutrition, and population indicators over the last decade (Figure 1). The country achieved the targets of the millennium development goal on child health well ahead of time (1). The 2011 Ethiopian demographic and health survey (DHS) reported that infant mortality declined by 42% and under-five mortality by 47% over the 15-year period preceding the survey. Progress towards the targets on maternal health, however, has stagnated. Between the 2005 and 2011 surveys, no progress can be documented (2).

Figure 1. Maternal and child-health indicators in successive demographic and health surveys



Source: adapted from Demographic and Health Survey 2011.

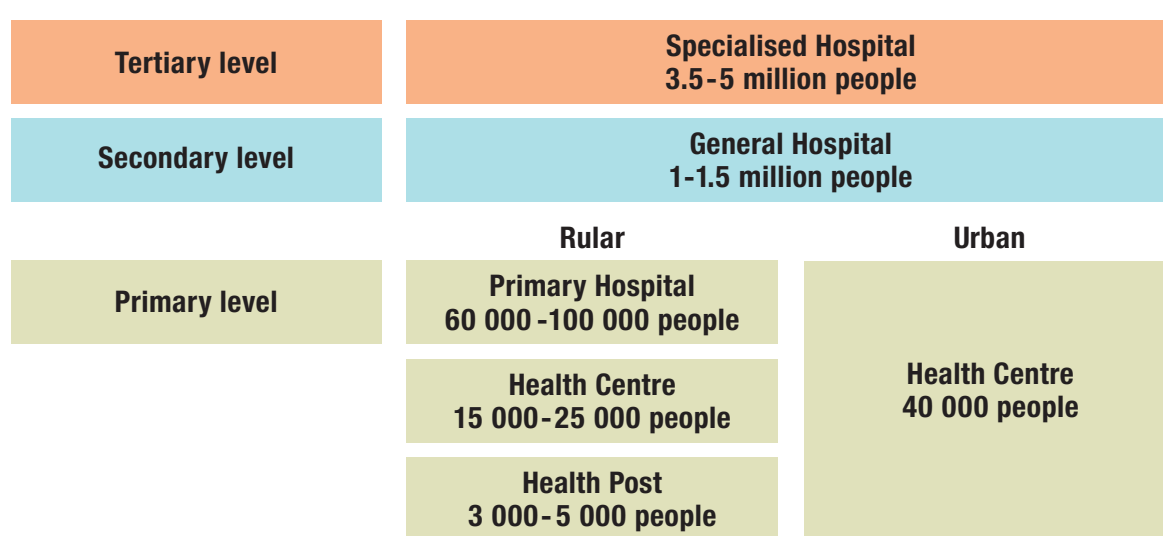
¹ Please refer to the Annex for the definition of terms.

1.1.2 Health system

The health system of the Federal Democratic Republic of Ethiopia is guided by a 20-year health sector development strategy, which is implemented through a series of five-year health sector development programmes (HSDP). The consecutive HSDPs are aligned with international commitments, such as the millennium development goals and national plans such as the Plan for Accelerated and Sustained Development to End Poverty (2005/06–2009/10), and the Growth and Transformation Plan (2010/11–2014/15). Currently, the country is implementing the fourth health sector development plan (HSDP IV).

HSDP IV has introduced a three-tier health-delivery service system (Figure 2). The primary level consists of primary healthcare units (health posts and health centres) and primary hospitals; secondary level services are provided by general hospitals; and tertiary services by specialized hospitals (3).

Figure 2. Ethiopia's three-tier healthcare system



Source: adapted from Federal Ministry of Health, Health Indicators 2012.

There has been a major expansion of primary healthcare units in the last decade through rehabilitation and upgrading of existing facilities and construction of new facilities (Table 1). The number of health centres has increased almost fivefold and the number of health posts has more than doubled (4).

Table 1. Expansion of primary healthcare units

Type of health facility	Baseline in 2005	Target for 2015	Available in 2013	Average staffing norms for each of the facilities
Health post	6 191	15 000	16 048	2 Health Extension Workers
Health centres	668	3 516	3 245	1 Health Officer 2 Midwives

Source: adapted from Ministry of Health annual reports.

1.1.3 Human resources for health

Development of frontline and middle-level health professionals has been one of the eight priorities of Ethiopia's health policy since 1993 (5) and a key component of successive health sector development programmes (Table 2). The main objectives of the HSDP IV are increasing staffing at all levels of the health service pyramid and the establishment of effective human resource management systems. A strategic plan for human resources for health was developed in 2008. The plan details human resource planning, management, education, training and skill development, legal frameworks, and financing mechanisms (6).

At the end of HSDP II, prior to the major human resource reforms, Ethiopia ranked in the lowest quintile among African nations in terms of density of healthcare personnel, with 0.3 physicians and 2 nurses per 10 000 population (7). There was also a problem of uneven distribution of the limited health workforce among and within districts and an inappropriate use of available skills. The reforms implemented since then resulted in a major increase in human resources for health. With the inclusion of health extension workers, Ethiopia had 11 health workers per 10 000 population by 2011 (8).

Table 2. Development of human resources for health in Ethiopia

	End HSDP I (2002) # Density		End HSDP II (2005) # Density		End HSDP III (2010) # Density		Mid HSDP IV (2011/12) # Density	
Medical doctors	1 888	1:35 604	1 996	1:35 604	2,152	1:36 158	2 923	1:28 847
Health officers	484	1:138 884	683	1:104 050	1 606	1:48 451	4 923	1:17 128
Nurses	11 976	1:5 613	14 270	1:4 980	20 109	1:3 870	36 672	1:2 299
Health Extension Workers			2 739	1:25 940	33 819	1:2 301		

Data Source: Ministry of Health

2.1 Context and drivers of the reforms

The evaluation of the first five-year health sector development programme triggered the introduction of major human resource reforms. At the end of the programme in 2003, the overall performance of the health sector had improved, but there were major gaps in the delivery of essential services in rural areas. Only one quarter of pregnant women received antenatal care, and only one third of children were fully immunized (9). Distances to health facilities were a major barrier to the use of services (10,11).

The human resource reforms were implemented in a policy environment of changing health needs and evolving priorities.

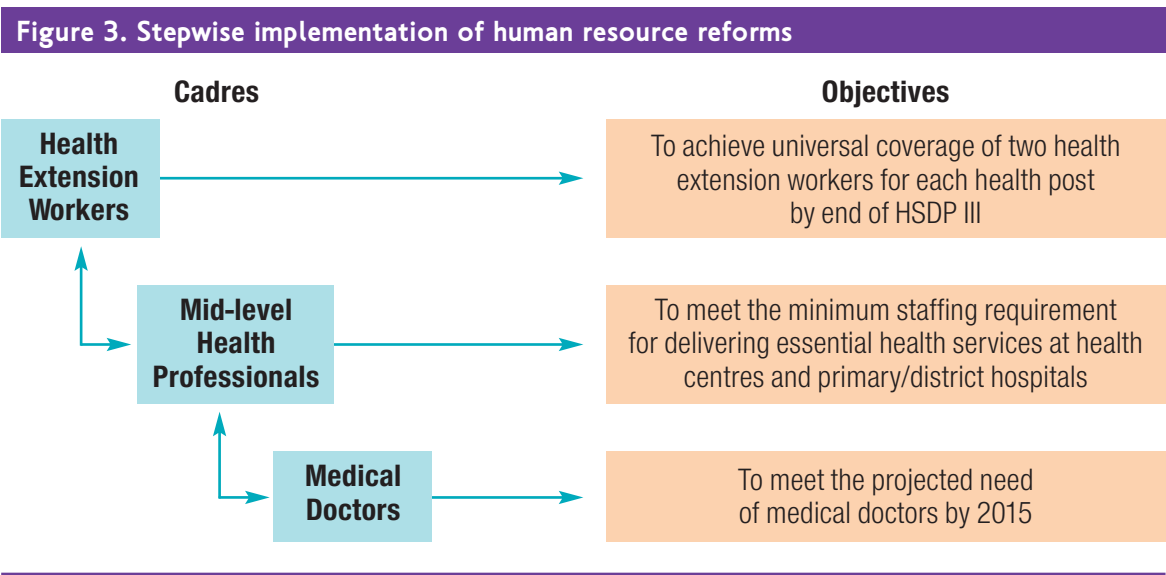
- With the aim of addressing poor performance in the delivery of essential services and of meeting the targets of the millennium development goals, the Government of Ethiopia made the expansion of access to primary healthcare its topmost priority. This was operationalized through the last three health sector development programmes (HSDPII-IV), the accelerated expansion of primary healthcare facilities, the health extension package programme, and the essential services package.
- Expanding access to primary health care required an equitable distribution of new facilities and of the workforce among regions. In Ethiopia, a federally structured country, providing primary healthcare services is a regional and district (woreda) function. The expansion of facilities, capital investment and recurrent costs (including the costs of human resources), had to be financed to a significant degree by the regional and woreda levels of government.
- Financial support to the health sector by development partners increased significantly, both through budget/sector support and through project financing. The human resource reforms benefited from this injection of additional funds.

Overall, the accelerated expansion of primary healthcare units served as the major driving force for human resource reforms. At the start of the reforms, the health workforce was inadequate to satisfy the demand for services from existing health facilities, let alone the additional demand fuelled by the accelerated expansion. The reforms therefore mainly focused on supply-side interventions through increasing the production of key staff categories. The scale-up targeted both existing and new cadres with the aim of enhancing the availability, distribution and performance of health workers to achieve universal access to primary health care, and included:

- creating the new cadre of health extension workers to be deployed in health posts to address the family and community levels of demand;
- the ‘flooding’ strategy to produce the necessary middle-level professionals for deployment to the increasing number of health centres;
- implementing task shifting for specialized tasks that could not be covered through the training programmes of the flooding strategy; and
- expanding the capacity of the country to produce health professionals, especially general practitioners, by introducing innovative pre-service training programmes.

These reforms and initiatives can be categorized into three major areas that were implemented in a stepwise fashion to align with the expansion of health services (Figure 3). They started with the staffing of community-level services; expanded to health centres and primary/district hospitals; and continued to medical schools to meet the requirements of higher-level health facilities.

These reforms were introduced in a stepwise manner starting from the end of HSDP I. The achievement in terms of enhancing the availability of health workers before and after the reform is summarized in Table 2. With regard to improving the uneven distribution of the workforce, although complete and updated data on distribution by region is not available for all categories, the flooding strategy is expected to improve the uneven distribution by “crowding out” health workers into rural areas.



2.2 Reform 1: the health extension programme

2.2.1 Rationale and reform objectives

The large gap in access to health services between urban and rural populations was a major motivating factor for launching the health extension programme (HEP) and the creation of a new cadre of salaried community health extension workers. The clinical curative health services provided in Ethiopia neglected the needs of more than 80% of the population living in rural areas. They were also poorly aligned with national health priorities. More than 75% of the disease burden in the country was related to preventable and communicable diseases. An analysis of investment and recurrent costs, as well as of the epidemiological situation in the country, led to the conclusion that most healthcare needs of the rural population could only be met through the expansion of primary healthcare facilities (5,12).

This realization led the Ethiopian Government to develop a system of primary healthcare delivery structures and the associated service package in an initiative introduced under the health extension programme. The main agenda of this programme was to promote communities’ ability to improve their own health services. The programme established community health services that aimed to improve access to high-impact preventive and basic curative care, especially for people living in rural areas (13). The Government’s goal was to provide two salaried community health workers for each village. The targeted density of coverage was an average of two HEWs for each population of 5000 people.

2.2.2 Contextualized evidence-based services

Training for the health extension programme focuses on a package of 16 well-defined health interventions. The package is organized into four major categories: hygiene and environmental sanitation, disease prevention and control, family health services, and health education (Table 3). The intervention packages

and the implementation arrangements were designed to address the prevailing health problems, taking into account the social context, the evidence base, and the feasibility of delivering services by community-level health workers (10,11,14).

The human resources were tailored to address the different health needs of rural, pastoral, and – more recently – urban communities. The contextualized focus on prevailing health problems in the design of the training programme enabled the health extension workers to gain the required knowledge and skills to deliver high-impact and cost-effective interventions, including childhood immunization, family planning services, prevention and treatment of malaria, and the treatment of diarrhoea and pneumonia in children under five years of age (10,11).

Table 3. Components and service packages of the health extension programme

Hygiene and Environmental Sanitation

- Excreta disposal
- Solid and liquid waste management
- Water supply safety
- Food hygiene and safety
- Healthy home environment
- Arthropod and rodent control
- Personal hygiene

Disease Prevention and Control

- Prevention and control of HIV and other STIs
- Tuberculosis prevention and control
- Malaria prevention and control
- First aid

Family Health Services

- Maternal and child health
- Family planning
- Immunisation
- Adolescent and reproductive health
- Nutrition

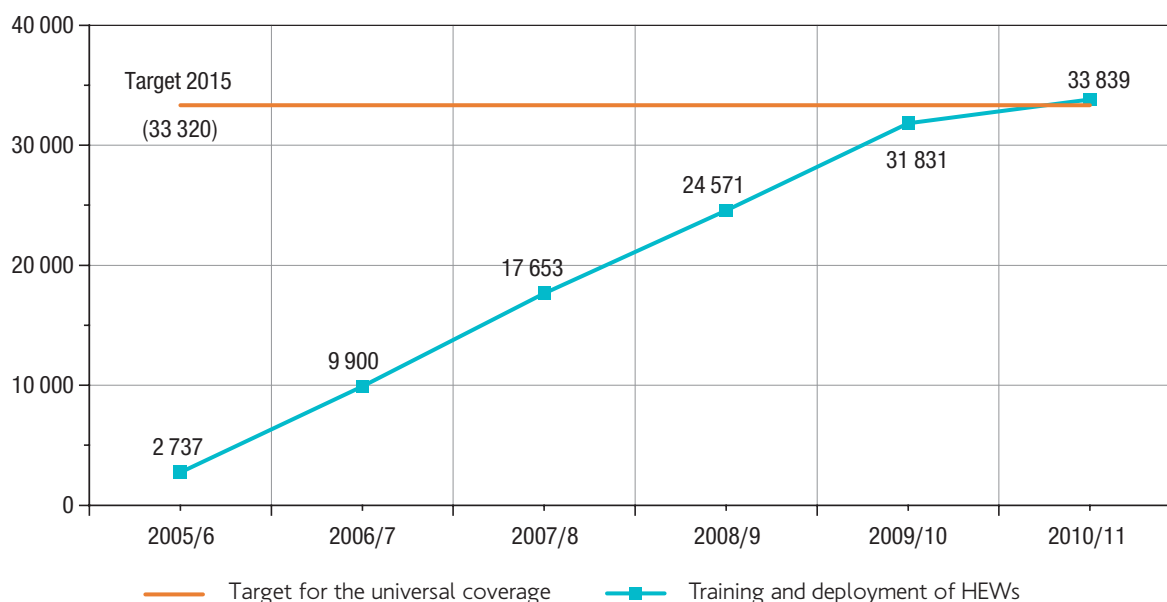
Health Education

Source: adapted from Ministry of Health, Health Extension Programme Profile 2007.

2.2.3 Institutionalization and effectiveness

The number of health extension workers deployed is shown in Figure 4. By the end of 2012, a total of 35 347 health extension workers had been trained and deployed, surpassing the community-level service component of the HSDP III target for ensuring universal coverage (3). Since 2010, the HEW training has focused more on upgrading skills and career development for existing HEWs, rather than training new ones. Training new HEWs, however, still continues for pastoralist and urban areas.

Figure 4. Number of health extension workers deployed



Source: Ministry of Health; HSDP documents

Furthermore, in addition to enhancing the availability of community-level health workers who are evenly distributed among regions, there is also evidence concerning the effectiveness of this reform in improving the utilization of essential services (Table 4). This has been documented in a number of studies and reports (for example, 9,15). Compared to 2000–2004, health indicators during the period following the introduction of the programme (2005–2010) show marked improvements for high-impact interventions such as family planning, antenatal care, maternal health care, and hygiene and sanitation.

Similarly, studies which compared areas served with HEP with those not served have shown that the programme has positively impacted health determinants. For instance, there is improved knowledge and use in HEP areas compared to non-HEP areas in improved sanitation (75.6% and 36.3%, respectively), proper human waste disposal (57.6% and 34%) and handwashing facilities present (55.7% and 39.9%). A recent study by the World Bank documented that pregnant women in the poorest rural households were 15% more likely to receive antenatal care and 12% more likely to vaccinate their child against measles if they had received a visit from an HEW than if they had not (36,37).

Table 4. Coverage of high-impact interventions before and after introduction of the health extension programme

	2004	2011
Contraceptive acceptance rate	23%	62%
Ante-natal care	41%	82%
Skilled delivery	10%	17%
Postnatal care	16%	42%
Access to improved sanitation	29%	86%

Source: adapted from Teklehaimanot & Teklehaimanot (9).

The gains in effectiveness of the deployment of health extension workers emanate from their provision of services close to the community, including house-to-house visits. Although it is generally difficult to attribute gains made by interventions such as the health extension programme, there are indications that those interventions have contributed to improved health. Health extension workers have brought the treatment of malnourished children – the main cause of poor health in children – closer to communities.

In 2012/13, approximately 95% of health posts were treating severe acute malnutrition. Integrated community case-management of pneumonia, malaria, diarrhoeal diseases, and severe acute malnutrition was scaled up in a short time and by 2013 this approach was offered in 79% of health posts. The delivery of these essential services has been scaled up without compromising quality. An assessment of service delivery reported that children were receiving correct treatments for their illnesses, as per the protocol for management of these conditions (16).

2.2.4 Community involvement and ownership

The health extension programme is based on the following philosophy: when knowledge and skills are transferred to households, they will take greater responsibility for promoting and maintaining their own health (14). Health extension workers are charged with facilitating this process, through health-promotion activities at the community level and by mobilizing communities to organize ‘health development armies’² (17). This community mobilization has played a key role in influencing health behaviours and attitudes and in improving hygiene and environmental sanitation (9, 15).

2.2.5 Improved efficiency

A large number of published studies document the effectiveness of the health extension programme in improving access to services and health outcomes, but there are no published reports comparing the cost-effectiveness of the programme with conventional approaches to the provision of community health services. The deployment of health extension workers has great potential for addressing inefficiencies related to the mobility of health personnel. HEWs are generally selected within the community, thereby, they are unlikely to move away from their posts. A review of HEWs’ working conditions reported that they have a reasonable income level by rural standards, approximately US\$ 83 per month (18). Because the salary of health extension workers is lower than that of professional health workers, a gain in efficiency results from a decreased cost of wages.

In the absence of health extension workers, the closest cadre that could implement the HEP would be either community volunteers (this approach has already been tried in many developing countries, including Ethiopia, but has failed to produce the desired outcome) or community nurses or other similar-level professionals. Considering the salary difference between these two cadres (HEWs and community nurses), the deployment of HEWs rather than community nurses has saved the Government nearly US\$ 8 million per year as a result of a lower wage bill. Similarly, training costs are lower as the duration of training is significantly shorter than conventional healthworker training programmes – one and three years, respectively.

Finally, the programme has succeeded in enhancing allocative efficiency among regions in terms of the distribution of human resources, using the ratio of highest to lowest healthworker density as an efficiency indicator. Health extension workers are the only cadres for whom the ratio of health workers to population is relatively similar among the regions (3). Along the same lines, as HEP services involve all households in the community and are free of charge at the point of delivery, the poor will have equal access to the services. Overall efficiency and effectiveness gains of the health extension programme is shown in below Table 5.

² A health development army is an organized movement of community members for participatory learning and action. It consists of up to 30 households residing in the same neighbourhood.

Table 5. Efficiency and effectiveness gains of the health extension programme

Programme characteristics	Gains in efficiency and effectiveness
Evidence-based intervention packages to address service needs at community level	<ul style="list-style-type: none"> • Relevant to community needs as the programme focuses on 75% of the burden of disease in the country • Addition of new interventions as new evidence develops (e.g. Integrated Community Case Management)
Institutionalization of community level services by deploying salaried health extension workers	<ul style="list-style-type: none"> • Increased provision of primary health care at lower costs as the training and payroll costs of health extension workers are lower than the costs for conventional health workers • The skill mix is optimized by the use of generalist community level health workers
The Health Development Army	<ul style="list-style-type: none"> • Enhanced community involvement and empowerment through participation in identifying needs, suggesting solutions, implementation and follow-up of activities • Additional community support for the work of health extension workers
Recruitment from same community	<ul style="list-style-type: none"> • Improved retention and reduced mobility • Acceptance by the community
Female community workers (with few exceptions)	<ul style="list-style-type: none"> • Effective delivery of maternal and child health services through easier communication with mothers • Culturally more acceptable
Contextualization (Training of three types of HEW: agrarian, urban and pastoralist)	<ul style="list-style-type: none"> • Addressing the different development and health needs of distinct regions and communities

Source: adapted from Teklehaimanot & Teklehaimanot (9).

2.2.6 Enabling factors and challenges

Government leadership and political commitment have been key factors in the successful implementation of the health extension programme. At the national level, the progress and challenges of the programme are regularly reviewed in the bimonthly meetings of the Ministry of Health with development partners and the bimonthly meetings with regional health bureaux (11). At the local level, one of the two health extension workers is a member of the village council which regularly discusses the performance of the programme.

The Government's commitment to the programme is demonstrated by the national budget allocations for curriculum development, training, and payroll costs of the health extension workers, as well as their full integration into the civil service (11). Scaling-up of health extension workers and health officers would not have been achieved without strong collaboration between the Ministry of Health and the Ministry of Education, which provided the technical and vocational educational training and resources, including teachers (38).

Recruitment. Eligible candidates for training as health extension workers are females aged 18 years or over, with at least a 10th grade education, and who are members of the communities where they will be deployed. An exception is made in the pastoralist regions of the country where males are also accepted and where educational requirements are reduced to eight years of schooling because of the shortage of candidates that meet educational requirements (14). The selection is performed by a committee of members nominated by the local community, representatives of the district health office, the district capacity-building office, and the district education office.

These recruitment principles are not always followed for a number of reasons, including the absence of suitable candidates in some communities (19,20,21). There is no published evidence about differences in performance between health extension workers recruited locally and those from other communities. This should be assessed in a systematic study of the effectiveness and cost-effectiveness of current recruitment criteria.

Systems integration. In order to be effective and sustainable at scale, a community health service should be an integral component of the national primary healthcare system (22). The community services provided under the Ethiopian health extension programme meet this criterion by being part of the primary healthcare unit (PHCU), the lowest of the three levels in the health service pyramid (10,11) (Figure 2). The continuum of care is assured by the linkages within the PHCU of health workers to the health centres and primary hospitals. This linkage has been facilitated by the human resource reforms at higher levels of the health pyramid discussed below (23).

Training. The minimum educational requirement for recruits and the 12-month formal training programme (involving one quarter theoretical teaching and three quarters practical apprentice training) are considered important factors for success (24). The average monthly cost of the training programme per health extension worker was about US\$ 234 for training and US\$ 178 for apprenticeships (38).

There are, however, reports indicating that covering 16 service packages in just one year is insufficient to assure quality care, especially for antenatal and obstetric delivery services (25). Such gaps risk a negative impact on the programme in two ways. First, they may lead to bypassing of essential maternal-health services by pregnant women who may consider the skills of the community-level health workers inadequate. The second is that they may require additional in-service training to cover identified gaps in skills, causing service interruptions. It is therefore essential to critically review and align training duration with the number and complexity of the service packages to be covered, so that the initial training adequately provides graduates with sufficient knowledge and skills to deliver high-impact interventions.

Career structure and motivation. There were delays in developing a career structure for health extension workers. These delays contributed to low motivation and high attrition (26). Recently, the Government acknowledged the problem and HSDP IV has begun implementation of a career-development plan for health extension workers in order to update and improve the skills and knowledge of Level III HEWs to achieve certification at Level IV (3). Currently, nearly 2123 HEWs have been upgraded to Level IV and over 2300 HEWs have been enrolled for upgrading to Level IV (33).

2.3 Reform 2: task-shifting and scaling-up of mid-level health professionals

2.3.1 Rationale and major reform activities

Task-shifting is defined as delegating tasks to existing or new cadres who receive either less training or narrowly tailored training (27). It may take various forms – including substituting tasks among professionals; delegating tasks to professionals with less training; creating new professional or paraprofessional cadres, whereby tasks are shifted from workers with more general training to workers with specific training for a particular task; or a combination of these.

The accelerated expansion of primary healthcare units and the general commitment to bring health services closer to communities fuelled a major demand for human resources in Ethiopia (12,7). Meeting the additional demand through scaling up the production of conventional cadres of health professionals such as physicians and nurses was not a feasible option, primarily because of the long lead-time, the limited number and capacity of training institutions, and the limited pool of applicants. The Government of Ethiopia therefore shifted some of the tasks and functions of generalist and specialist physicians to two cadres of mid-level health professionals: health officers and emergency surgical officers (ESO).

Health officer training was not a new concept in Ethiopia. In 2004, the training was limited to a few colleges and there were only 683 health officers working in the public sector. The plan for the accelerated expansion

of primary healthcare units called for an increase in the number of health centres from 668 in 2005 to 3516 in 2015, each one to be staffed by at least one health officer. The Government of Ethiopia therefore launched the accelerated health officers' training programme (AHOTP) with the objective of training and deploying them to provide and lead primary healthcare services in health centres and primary hospitals. Through the AHOTP, more than 3573 health officers had been trained and deployed by the end of 2010 (3).

The emergency surgical officer is a new mid-level cadre introduced by the human resource reforms. The existing pool and production of gynaecologists and surgeons was barely enough to adequately staff general hospitals, let alone provide comprehensive emergency obstetric and newborn care in the newly upgraded district and primary hospitals. The emergency surgical officer training started in 2009 in five universities which had experience in implementing AHOTP.

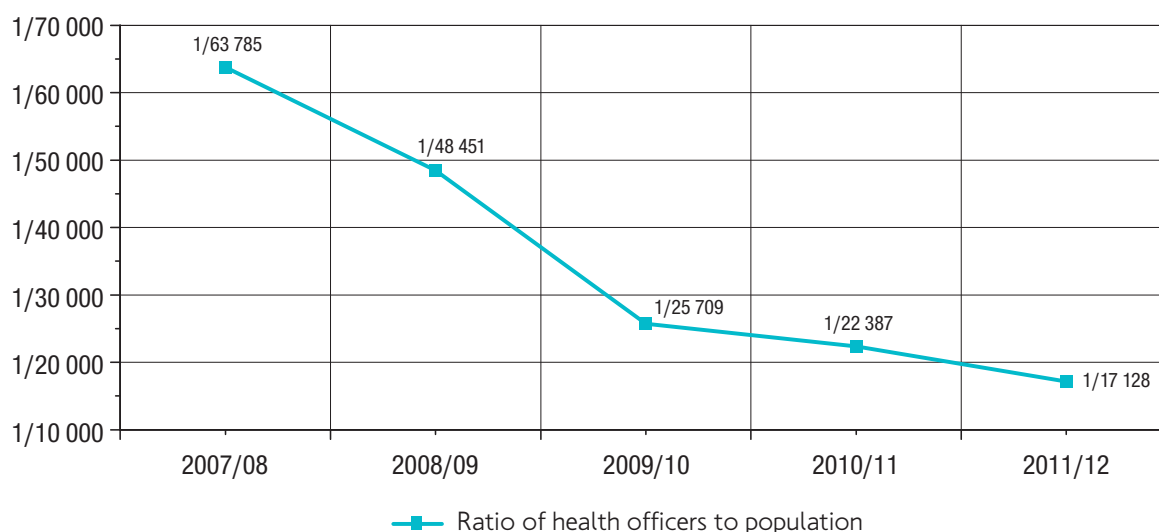
The expansion of emergency obstetric and neonatal services also led to a shortage of midwives and anaesthetists – two professional cadres for whom the targets of the third health-sector development programme were not met (3). The HSDP IV therefore introduced a programme for nurses to enter into training for anaesthesia and midwifery, an approach that is expected to significantly reduce the duration of training (26).

2.3.2 Utilization of non-teaching hospitals as training centres: health officers and emergency surgical officers

Shifting tasks from physicians to non-physician clinicians such as health officers and emergency surgical officers required a major increase in training capacity. There was limited capacity in universities and colleges to scale up the production of health professionals. The expansion of this capacity under the AHOTP was achieved through the utilization of non-teaching hospitals as training centres. This approach was later expanded to the training of other cadres.

Several non-teaching hospitals with sufficient caseloads and senior clinicians were identified to serve as training sites for non-physician clinicians. However, these hospitals lacked the required educational experience and infrastructure. The universities and colleges, on the other hand, had insufficient clinical faculty members and practical training sites to expand their enrolment. To fill this gap, twenty non-teaching hospitals were linked with five nearby universities. This has strengthened collaboration between the health and education sectors in the production of health workers. The increased training output translated into remarkable progress in the deployment of health officers, improving their ratio to population from 1:63 785 in 2007–8 to 1:17 128 in 2012 (17), (Figure 5).

Figure 5. Health officers per population



Source: Ministry of Health, HSDP Annual Performance Report 2012/13.

The training programme for emergency surgical officers followed the same model. Implementation was begun by universities that had already gained experience in training of health officers, and was rapidly scaled up to 11 colleges and universities and 34 affiliate hospitals in just five years. As of June 2013, a total of 536 officers were enrolled in the programme and a total of 136 emergency surgical officers had graduated and been deployed across the country (8).

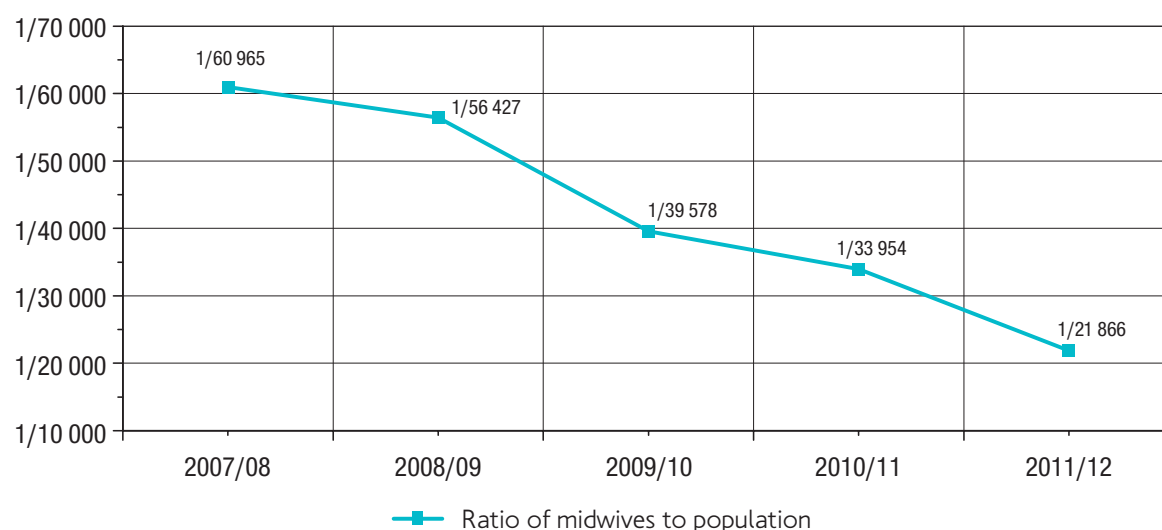
With the current rate of enrolment of 175 per year, and an attrition rate of about 2%, the training programme is likely to produce more than 1000 emergency surgical officers by 2020. The ESO training programme has also improved access to emergency obstetric services in rural communities, as indicated by a recent report on the volume and type of surgical interventions conducted by ESOs and the context in which task-shifting was implemented. The report revealed that the majority of ESOs have been deployed at the primary-hospital level, improving rural communities' access to emergency obstetric and surgical interventions with decreased referral to higher-level hospitals. According to this report, which covered 10 selected hospitals in the four major regions where ESOs were deployed, in just a one-year period over 2100 obstetrics/surgical cases were reported – over 96% of which were performed by ESOs (34).

Overall, the existing evidence indicates that the ESOs are delivering services according to the protocols for most obstetric and emergency surgical conditions, with few intra- or post- operative complications. However, it is important to note that there are also some gaps and variations among the graduates in terms of their performance and clinical decision-making skills. This situation calls for further study, to identify whether these competencies are related to the difference in the quality of pre-service training among institutions or their work environment (34).

2.3.3 Training mid-level professionals with nurse-level entry

In 2009, Ethiopia had only 1379 midwives, falling far short of the target of deploying two midwives to each of the 3516 health centres planned to be established by 2015 (3). Capitalizing on the availability of a relatively large number of nurses in the labour market, the Government launched an accelerated midwifery training programme in 15 regional health science colleges, targeting nurses as training candidates. In the subsequent three years, 3200 nurses graduated from the midwifery training programme and were deployed nationwide (17). The midwife to population ratio decreased from 1:60 965 in 2007–08 to 1:21 866 in 2011–2012 (17), (Figure 6).

Figure 6. Midwives per population



Source: Ministry of Health, HSDP Annual Performance Report 2012/13.

The increased availability of midwives has translated into an improved institutional delivery rate. For example, according to a recent report (35) which compared the institutional delivery rate before and after the deployment of midwives at selected health centres, institutional deliveries have markedly risen after the deployment of midwives with an increase of over 60%. Although other initiatives such as the health extension programme, the health development army and other health-promotion activities may have contributed to this, the increased availability of midwives has also played its role.

In parallel, a training programme for nurse-anaesthetists was launched in 11 regional health science colleges. The model of nurse-level entry into training programmes for mid-level health professionals has also contributed to the scale-up in the number of health officers. Many graduates of the accelerated health officers' training programme entered with a nursing background.

These training programmes have shown that critical shortages of human resources for emergency obstetric and neonatal care can be mitigated through specialized training programmes offered to nurses, when they are available in the market. However, the initiative is still in its early stages and there is no evidence yet that greater numbers of midwives, ESOs, and nurse-anaesthetists have translated into improved performance in maternal and newborn care. Further studies are needed to provide systematic evidence of the impact of the mobilization of such health workers on health-service utilization and outcomes.

2.3.4 Focus on mid-level health professionals

The focus on mid-level health professionals such as health officers, emergency surgical officers, midwives, and nurse-anaesthetists has improved the distribution of human resources for health across the regions. The retention of these cadres in rural posts appears to be better than for medical doctors, although there are no published studies to confirm this.

2.3.5 Local recruitment

For the recruitment of candidates for mid-level health professional training, the Government of Ethiopia established a 'rural pipeline', creating regional quotas for applicants from disadvantaged regions as long as they met entry requirements. This approach is expected to reduce regional disparities, but its effectiveness and impact needs to be evaluated.

2.3.6 Efficiency gains through optimizing the mix of skills

The costs of pre-service training and remunerating specialized mid-level health professionals are significantly lower than similar costs for medical doctors. Therefore, this approach generates efficiency gains in terms of overall training costs and the wage bill. Even under the hypothetical assumption that sufficient medical specialists such as obstetricians, surgeons, anaesthetists, and general practitioners were available to staff the increasing number of primary and district hospitals, they would present a serious budgetary challenge. Furthermore, the limited international marketability of the skills of mid-level professionals helps address inefficiencies created by the international brain-drain due to the emigration of health professionals.

2.3.7 Efficient use of resources and infrastructure

The deployment of mid-level professionals, especially emergency surgical officers, to primary and district hospitals has improved the efficiency of the use of infrastructure. Prior to the programme, the surgical and obstetric services in these health facilities had been unutilized or underutilized because of the lack of qualified personnel.

2.3.8 Enabling factors and challenges

Partnership, coordination, and leverage. The increased production of specialized mid-level health professionals was made possible through partnership, coordination, and leverage of resources from all relevant stakeholders. From the outset, the programme identified all stakeholders and reached a consensus about roles and responsibilities. The initiative brought together the health sector at the central and peripheral levels, the education sector, and the development partners who participated in planning, monitoring, and evaluating the progress and challenges of implementation. The monitoring mechanism included quarterly meetings at the national level, involving the Ministry of Health, the Ministry of Education,

universities, regional health bureaux, the hospitals participating in the training programme, and the health-sector development partners supporting the programme. This partnership has greatly contributed to smooth implementation and to building the capacity of training institutions.

Approved posts. Creating new cadres of health professionals by shifting tasks from physicians to non-physician clinicians requires the creation of salaried civil-service positions to absorb the graduates of the training programmes. Long delays or gaps in deployment of non-physician clinicians would increase the risk of demotivation, attrition, and the deterioration of newly acquired skills. The Federal Ministry of Health and regional health bureaux facilitated the approval of these posts by working closely with federal and regional civil service bureaux.

Quality of care/measuring patient outcome. Published studies from other countries have documented the effectiveness of task-shifting to non-physician clinicians in terms of patient outcome (for example, 28,29). No such studies of the Ethiopian experience have been published. The type of training, the context of deployment, and the overall social context in which health services are delivered differ from country to country. It is therefore important to study and document the quality and outcomes of care provided by the new mid-level professionals against the counterfactual of a conventional physician-centred approach in Ethiopia.

A regulatory framework of accreditation and licensing. There is still some lack of clarity about the scope of practice and licensing requirements for the new cadres of mid-level health professionals in Ethiopia. For instance, the ESO assessment has reported some cases where ESOs have conducted procedures that are not stated as their role in the training curriculum (34). Additional work is required to establish quality-assurance mechanisms and a regulatory framework – starting from the accreditation of training institutions and including certification, licensing, and defining the scope of practice of the graduates.

Career structure and motivation. One major gap in the implementation of this programme is the absence of a clear career structure for ESOs: ESO graduates have themselves expressed this concern. It is critical to define a clear career structure for ESOs to ensure that they are motivated and maintained in the system to serve rural populations.

2.4 Reform 3: reforming the curriculum for medical education

2.4.1 Rationale and reform objectives

Although modern medical education began in Ethiopia in 1896, the country suffers from a chronic shortage of medical doctors with little improvement of physician to population ratios over the years (30). Several factors, including emigration and limited output from existing medical schools, contributed to this problem (26). In 2008, the draft strategic plan for human resources in health highlighted that the country was a long way from meeting WHO standards and proposed an innovative approach to scaling up medical education.

With the aim of increasing the number and competency of medical doctors, the Ministry of Health in collaboration with the Ministry of Education launched the New Medical Education Initiative (NMEI). The Initiative, with its innovative curriculum developed in 2012, was introduced into 13 additional colleges and universities. The curriculum addresses some of the major challenges of traditional curricula – including the irrelevance of some of the topics taught in basic science, the lack of integration of subject matters, and the need for continuing education after graduation (31). Admission to the NMEI requires an undergraduate degree in natural sciences (this was not previously allowed) and candidates are selected on the basis of an entry exam and an interview to ascertain interest, commitment, and desire to serve the community. This expanded the pool of candidates for medical schools.

Major features of the new curriculum (of 4.5 years) are that it:

- is organized around the six major competencies recommended by the Accreditation Council for Graduate Medical Education;

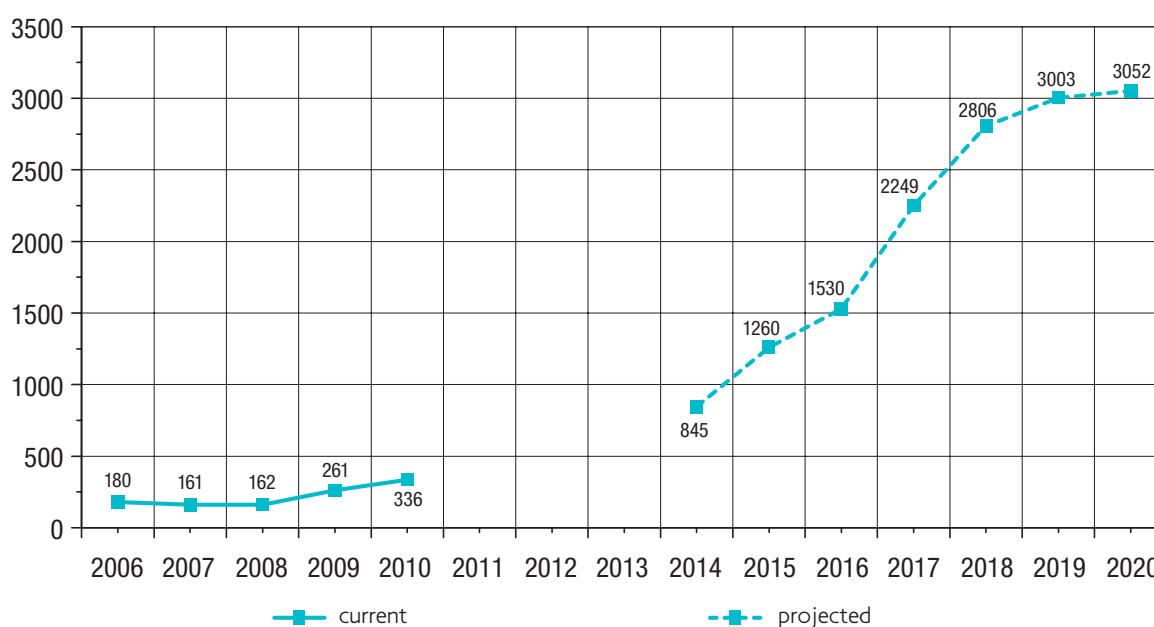
- has moved from discipline-based instruction to integrated instruction with both vertical and horizontal integration;
- incorporates problem-based learning and self-directed learning as major components of the curriculum;
- introduces the students to early clinical contacts, starting in the first year;
- introduces community-based education and practice, familiarizing students with local health problems and the context in which they will be working.

The NMEI programme is still in its early stages and it would be premature to assess efficiency gains. Nevertheless, some potential gains can be projected.

2.4.2 Availability of medical doctors

Through the introduction of the NMEI, the number of medical schools in Ethiopia more than doubled from 11 to 24. The Initiative was introduced in three hospital medical colleges and ten universities that did not previously offer medical education. The annual number of graduates of the traditional medical education programmes had already been increasing since 2007, but a major increase in production of new physicians is anticipated with the graduation of the current 11 291 students in training. Assuming a 5% attrition rate and maintaining the current numbers of enrolment per year, it is expected that the number of graduates per year will surpass 3000 after 2018 from a level of only 336 in 2010 (32), (Figure 7).

Figure 7. Current and projected number of medical graduates per year



Source: Ministry of Health, assessment of first intake of the NMEI, 2012.

2.4.3 Geographical distribution

The NMEI has the potential to improve the rural–urban distribution of physicians. Measures introduced to increase the uptake of rural posts by medical graduates include (31):

- the ‘rural pipeline’ (regional quotas for applicants from disadvantaged regions);
- location of many of the new medical schools outside regional capitals; and
- emphasis of the curriculum on family and community medicine.

It is also expected that the increased number of medical doctors will improve distributional efficiency, as labour market dynamics will force graduates to move to previously unserved areas. This approach will, however, require close monitoring by the Ministry of Health.

2.4.4 Educational quality

The move from the traditional type of medical education to new competency- and problem- based learning approaches is expected to improve educational quality and hence the competency of the graduates. A recent assessment of the implementation of the NMEI, however, found that some of the newly established colleges started the programme without the essential educational resources (32).

This deficiency may have a negative impact on educational quality and the effectiveness of the training programme unless timely corrective action is taken. If not addressed immediately, these shortcomings could lead to inefficient use of resources as it would require additional in-service training to close gaps in knowledge and skills among the newly graduated doctors.

2.4.5 Lessons learnt and challenges

Ethiopia is implementing various initiatives towards achieving universal primary health care which is dependent for implementation on the availability of key human resources for health (HRH). The country has prioritized and implemented HRH reforms towards the goal of achieving universal primary healthcare coverage. Review of the Ethiopian experience in the design and implementation of HRH reforms has identified the following factors which can also be applicable to other settings with a similar socioeconomic profile to enhance the effectiveness and efficiency of HRH reforms.

Faculty development. Limited understanding of the curriculum by the faculty, administration, and students was a major challenge in the implementation of the new medical-education initiative (32). The instructors had themselves graduated under the conventional medical education curriculum; faculty development prior to the introduction of the new curriculum was limited; and the turnover among the few trained faculty staff was high. The new curriculum was adopted by colleges without due preparation. Effective implementation requires sufficient faculty capacity, and faculty development needs to be institutionalized as an ongoing activity of medical schools.

Resource availability. The new curriculum is more resource-intensive than the conventional curriculum in components such as physical infrastructure, faculty, and educational resources including technology support (31). The fact that the curriculum was implemented in universities and colleges with no prior experience compounded the problem. The assessment of the new sites revealed many resource gaps, especially in educational resources for problem-based learning. A major transition to a new curriculum should be based on prior assessment of resource requirements and informed by a review of the experiences of medical schools that have successfully negotiated such a change.

Number of students. The new curriculum, among other requirements, involves learning in small groups and includes modules to enhance the clinical skills of students (31). This approach, however, is compromised by limited resources and the large number of students, with the risk that the training institutions revert to traditional classroom teaching. It is therefore essential that the number of students is appropriate to the availability of resources in training colleges.

Evaluation. The competency assessment of medical school graduates from the traditional curriculum revealed gaps in essential skills, despite the fact that these skills were included as major educational objectives in the curriculum. To avoid these gaps, a monitoring and evaluation system for the NMEI curriculum should be in place.

CONCLUSIONS AND LESSONS LEARNT

In response to shortages and an unequal distribution of health workers in Ethiopia, the Government successfully scaled up the health workforce to provide high-impact primary care and community-based services. This resulted in a four to fivefold increase in human resources and facilities in less than a decade. The supply-side reforms significantly improved the availability and geographical distribution of health workers. The ratios of health professionals to population have improved in all regions of the country. Policies of task-shifting to mid-level health professionals and reforms in medical education have the potential to further increase numbers and improve the geographical distribution of the health workforce. As a result of these policies and interventions, over 90% of the population in rural areas – home to 85% of the population in Ethiopia – has access to a healthcare facility within a two-hour walk.

Improved availability of health workers for family- and community-level services. Based upon evidence of the effectiveness and efficiency of expanding health service delivery at family and community levels, the Government of Ethiopia successfully introduced the cadre of salaried health extension workers, trained to provide 16 packages of high impact interventions (10). The programme was adapted to various contexts and population characteristics in the country by modifying and including relevant packages for rural, urban, and pastoralist populations. The training and deployment of more than 33 000 salaried health extension workers has achieved the target of offering primary services in each village, with an overall ratio of one health extension worker serving a population of 2301 people. The success of this initiative is documented by annual increases in coverage of high-impact interventions such as antenatal care, immunization, and family planning.

Improved availability of health workers for primary-level facility-based services. Meeting the human resource requirements for the expanding network of facilities was a major challenge that could not be met with existing staff and the output of conventional training programmes. The number of health centres, for instance, increased by more than 400% in less than 10 years. The Government of Ethiopia converted the challenge into an opportunity by introducing and training alternative health cadres. The training of four categories of health professionals was scaled up to provide an essential package of health services: health officers, emergency surgical officers, midwives, and nurse-anaesthetists. This led to marked increases in the number of facilities providing basic and comprehensive emergency obstetric and neonatal services. It is, however, too early to tell whether the increased availability of human resources will translate into increased utilization and improved health outcomes.

Improved availability of medical doctors. In order to increase the number of medical doctors, improve their distribution within the country, and enhance their performance, the Government of Ethiopia introduced the new medical education initiative. The fact that this initiative was introduced as a third step after ensuring that the scale-up of human resources met the requirements for frontline health workers and mid-level professionals, highlighted the importance of effective prioritization. It prevented the shift of resources to the production of high-level professionals before the primary health-service needs were addressed. The initiative included new developments in the field of medical education, a competency-based curriculum, integration of biomedical and clinical sciences, continuing professional development, and practice-based learning. The number of medical schools increased from 11 to 24 and the number of students greatly increased to currently 11 291 in training. The programme is on track to meet the projected need for medical professionals in the country.

Improved distribution of health workers. The human resource reforms in Ethiopia applied policies in pre-service education that addressed the uneven distribution of the health workforce. These included the preferential enrolment of students from disadvantaged regions in training programmes and the emphasis on community medicine in the training curricula. Potentially this will reduce the current urban bias in the distribution of health workers (including medical doctors) and increase the allocative efficiency of health services.

Reduced cost of health care. In addition to increasing the availability and equitable distribution of services, the reforms will potentially decrease the unit cost of care to the health system and to society. They bring high-impact healthcare interventions closer to communities and optimize the skill-mix of providers at the primary healthcare level. Deploying emergency surgical officers and nurse-anaesthetists rather than specialist surgeons and anaesthesiologists to primary hospitals significantly reduces the human resource costs of these facilities. An attempt has been made to estimate the annual potential savings of task-shifting and deployment of health extension workers. This estimate is based on differences in the annual salaries of health extension workers, health officers, and emergency surgical officers and the cadres they replaced (nurses at level 4, general practitioners and specialist general practitioners). As can be seen in Table 6, Ethiopia is managing to make potential wage-savings of about US\$ 20 million per year.

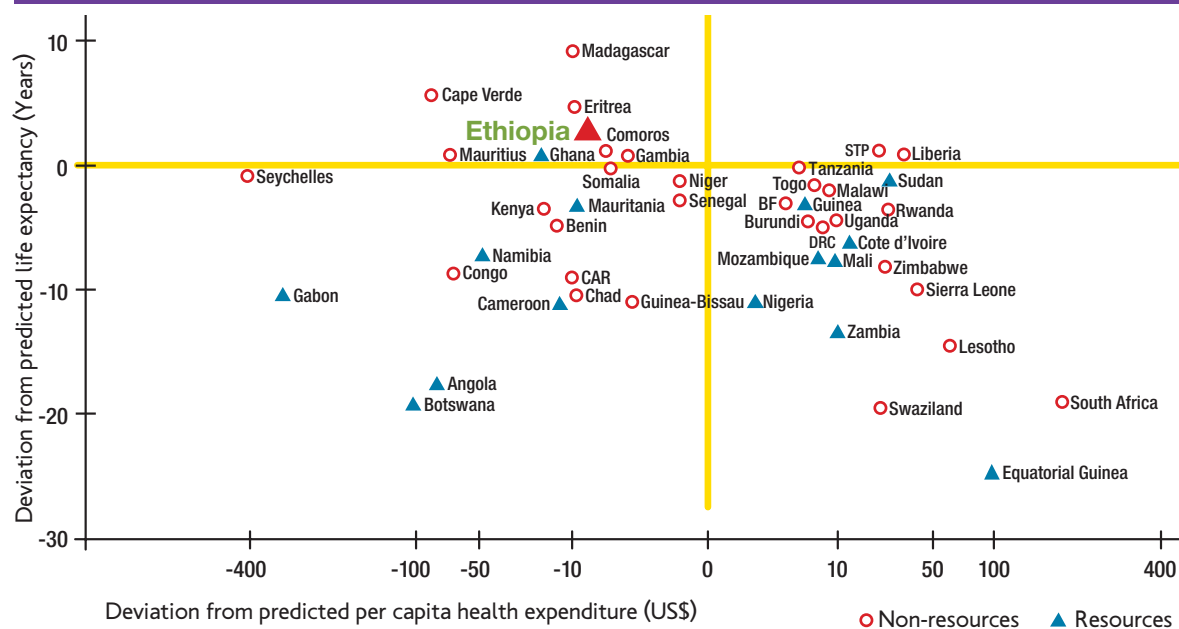
Table 6. Potential estimated wage-savings from task shifting in Ethiopia

	Potential annual estimated 'Savings'
Health extension workers	\$11.4 million
Health officers + emergency surgical officers	\$8.3 million
Total	\$19.7 million

Contribution to reaching the millennium development goals and efficiency gains. Direct attribution of the reforms to progress towards the targets of the millennium development goals is not possible. There is, however, documented evidence of the contribution of the health extension programme and the scale-up of health extension workers to increased coverage of high-impact services in child health and communicable disease control, including malaria and tuberculosis. Ethiopia is on track to reach the millennium development targets in child health, but has made little progress in maternal health, as was seen in Figure 1. The training and deployment of mid-level professionals such as emergency surgical officers, midwives, and anaesthetists is expected to greatly improve the care provided for major conditions contributing to maternal and neonatal deaths.

The programme is still in an early stage, and it is too early to evaluate the impact on reducing the maternal-mortality ratio. It is difficult to determine the disaggregation of per capita expenditures between primary and non-primary health care in Ethiopia and show the efficiency gains made as a result of task-shifting and investment in primary health care. However, there is evidence that shows investment in Ethiopia during the period when this transformation takes place is efficient as compared to other countries. The recent World Bank study (38) took two development variables with the highest correlation with health, nutrition and population outcomes – per capita gross domestic product and female education – and used them to predict the health outcomes and health expenditures which would result given these levels. If actual value of life expectancy is exactly the same as the predicted value, the country will be plotted on the horizontal yellow line in Figure 8. Similarly, if actual value of per capita health expenditure is exactly the same as the predicted value, the country will be plotted on the vertical yellow line. According to the analysis, Ethiopia is one of the few sub-Saharan African countries that have life expectancy higher than predicted, while per-capita expenditure remains lower than predicted, indicating overall high efficiency in the health sector (Figure 8) (38).

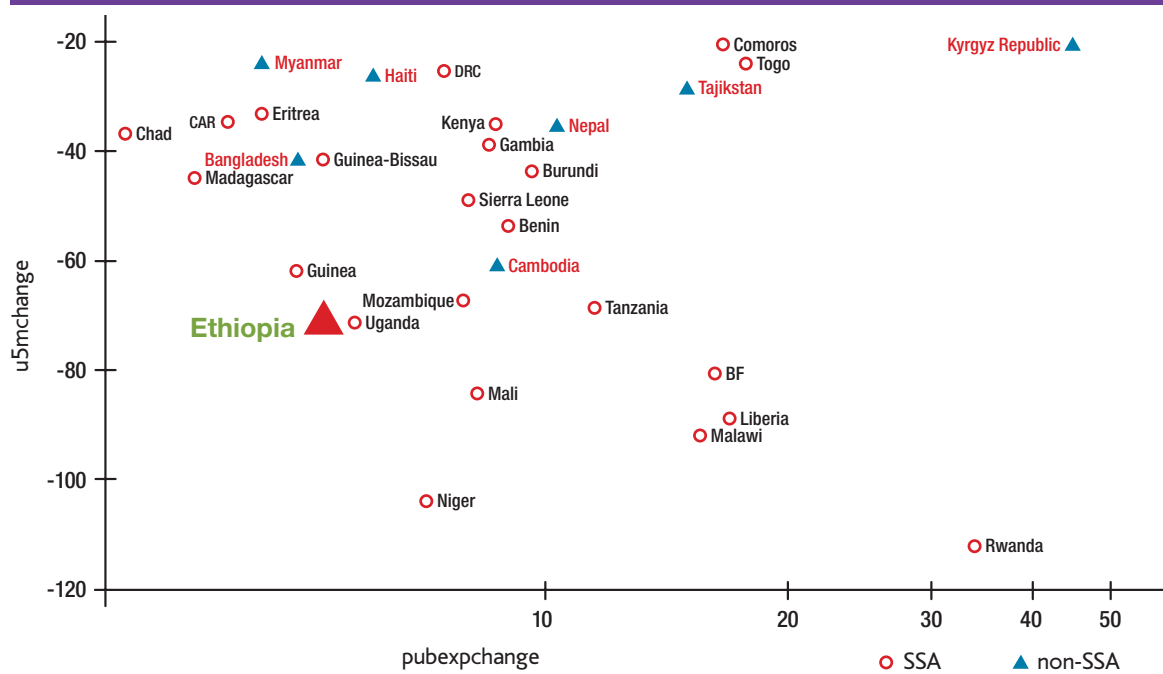
Figure 8. Comparison of Ethiopia's health outcome and expenditures with other sub-Saharan African countries



Source: World Bank, 2013. Ethiopia: health sector expenditure review note, page 39.

The study also compared Ethiopia with other low-income countries in terms of the extent of health-outcome improvement that was achieved relative to the increase in public health expenditure. Ethiopia is prominent in Figure 9 as none of the other countries achieved a larger reduction in under-five mortality for the same level of increase in resources – only (approximately) US\$ 5. Many countries had a larger increase in public expenditure, but did not achieve as much as Ethiopia. Only six countries achieved a larger reduction than Ethiopia, but they also experienced large increases in public expenditure on health (38).

Figure 9. Changes in per capita public health expenditure and under-five mortality (2001–2013) among low-income countries



Source: World Bank, 2013. Ethiopia: health sector expenditure review note, page 40.

Lessons learnt

- Defining and prioritizing the staff categories to be scaled up in a reform of human resources for health contributes to increasing the effectiveness and efficiency of the health sector. The social, epidemiological, geographical, and economic context of the country, as well as the evidence for high-impact interventions in health have to be taken into consideration.
- Carefully planned and timed supply-side measures in human resources, focusing on conventional and alternative cadres of mid-level health workers, have a great potential for improving the density, distribution, and performance of health workers, as well as the cost of delivering health services.
- The supply of health workers can be increased significantly in a relatively short time if there is sufficient political and managerial will.
- Newly trained health workers can be deployed to areas where they are most needed, if there is sufficient political will to implement appropriate recruitment and employment policies.
- New cadres of health workers should not be trained and forgotten: upgrading their skills and allowing career development are dynamic processes.
- Developing a new cadre of health workers can improve technical and allocative efficiency, as demonstrated by health extension workers. Salaried community-based health extension workers provide cost-effective interventions, ensure that supplies (such as vaccines) are used appropriately, and work in areas and among communities with a high need for services.
- Task-shifting (for example, from doctors to health officers) can increase technical and allocative efficiency by providing priority interventions at a lower cost in areas of need.
- The rapid expansion of a cadre of health professionals can encounter difficulties that should be addressed immediately before the problems are magnified. For example, scaling up the training of medical doctors encountered quality problems at the outset, and was therefore inefficient. The appropriateness of the training infrastructure and the availability of skilled and motivated trainers must be assured.
- Enabling factors for the realization of efficiency gains through human resource reforms include regular follow-up of the reform by top management, strong monitoring and coordination mechanisms for training and deployment, the inclusion of relevant stakeholders, and alignment of funding by government and development partners with agreed priorities.
- Although efficiency gains in terms of an improved staff mix, a decreased wage bill and improved geographical distribution of health workers can be ascertained early, assessing the impact in terms of increased utilization of services and improved health outcomes requires further studies.
- Quantification of the efficiency gains achieved through human resource reforms is difficult. There remains a need to develop guidelines and standardized methodological tools.

Definition of terms

Essential health service package (EHSP) also called the minimum health services package, refers to a set of cost-effective, affordable, and acceptable interventions for addressing conditions, diseases, and associated factors that are responsible for the greater part of the disease burden.

Ethiopian essential health service package has been designed based on core health and health-related interventions to address major health problems and disease conditions in the country. It includes the basic preventive, promotive, curative, and rehabilitative interventions that are considered to be the minimum that people can expect to receive through the various health-delivery mechanisms and facilities within their reach. The major components of the EHSP for Ethiopia are aligned with the health service extension programme (HSEP). The Ethiopian EHSP is organized into five major components (with the addition of a category containing basic curative care and treatment of major chronic conditions starting from the health-centre level) similar to the following HSEP components:

- family health services
- communicable disease prevention and control services
- hygiene and environmental health services
- health education and communication services
- basic curative care and treatment of major chronic conditions.

Ethiopia flooding strategy: the rapid scale-up of health workers that is designed to combine speed, volume, and quality of human resource production.

Health service extension programme (HSEP): a package of basic and essential promotive, preventive and selected curative health services, targeting households in the community, based on the principles of primary health care to improve the health status of families with their full participation. It forms the basis of the national health system, focusing mainly on preventive aspects of health services and promotion of healthful living in the community.

Health extension workers (HEWs): a new cadre of community-based health workers in Ethiopia. HEWs are selected by the community in which they live (in collaboration with district administration), to provide (after completing one year of training) promotive, preventive, and selected curative health services to the community of their origin, based on the values and principles of primary health care.

Innovative curricula: integrated competency-based curricula (unlike a discipline-based curriculum), which comprise problem-based learning as a major component.

Primary health care unit (PHCU): first level of care in the new three-tier system of Ethiopian health care, comprising primary hospital, health centre, and health post.

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