



Federal Democratic Republic of Ethiopia
Ministry of Health

THE HEALTH DEVELOPMENT ARMY: ITS ORIGINS, DEVELOPMENT AND CURRENT STATUS

The Health Documentation Initiative



This publication was produced to document the development of the Ethiopian Health Development Army by the Federal Ministry of Health.

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Federal Democratic Republic of Ethiopia

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Cover Photo: one-to-five network discussion. Tigray, Eastern zone, Edaga Hamus kebele

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Foreword



Our vision is to see healthy, productive and prosperous Ethiopians. Ethiopia has made significant strides in the past 20 years from having among the poorest health indicators in Africa to meeting most of the millennium development goals.

The Health Extension Programme has served as one of the primary vehicles for expanding access to essential health services throughout Ethiopia.

However, as improvements plateaued, the Health Development Army, particularly its component of women development groups were created to provide the final link of extending essential health services focused on women and children to the lowest base – households.

This paper will focus on how the Health Development Army initiative improved delivery of health packages and health-seeking behaviour by stressing community empowerment that is well organized, inclusive and collaborative.

I am confident that the experiences outlined in this paper will offer insights and lessons for future policies and scale-up.

Kesetebirhan Admasu, Minister
Federal Ministry of Health
Ethiopia

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Lastly, thank you to the documentation team that produced this report: Dr. Paul Nunn, Birouke Teferra and Semra Asefa.

List of abbreviations

ANC	Antenatal care
DHS	Demographic and health survey
EDD	Expected date of delivery
EDHS	Ethiopian Demographic and Health Survey
EmONC	Emergency obstetric and neonatal care
FMOH	Federal Democratic Republic of Ethiopia Ministry of Health
HDA	Health Development Army
HEP	Health Extension Programme
HEW	Health extension worker
HIV/AIDS	Human immunodeficiency virus/acquired immunodeficiency syndrome
PNC	Postnatal care
RHB	Regional Health Bureau
SNNPR	Southern Nations, Nationalities and People's Region
USAID	United States Agency for International Development
TBA	Traditional birth attendants
WDG	Women's development group

Executive summary

This paper is published under the Federal Ministry of Health's Documentation Initiative. It aims to describe the origins of the Health Development Army (HDA), the HDA's relationship to the Health Extension Programme (HEP), how the HDA works, what it has achieved, what the plans are to develop it further, what has made it succeed and how it could further improve.

The HDA began as a result of the then Minister of Health Dr Tedros Adhanom Ghebreyesus, and his then Director General for Health, Dr Kesetebirhan Admasu, looking for ways to intensify the impact of HEP, the primary care delivery strategy, that had been running in Ethiopia since 2003. The HEP was considered a success, but still 90% of women delivered at home. Maternal and neonatal mortality, and death rates in children from pneumonia were all too high. Much more needed to be done to improve hygiene at village level. They conceived of a "women-centred" health system based on the mostly male Agricultural Development Army that would "link leaders at the national, regional and district levels with women's groups in every village across the country." Using the health extension workers (HEW) and local development teams, that were already the backbone of the HEP, they planned to create a movement, an army, that would engage women to spread knowledge to every single household about better hygiene, improved nutrition, prevention and management of common childhood conditions and HIV, malaria and tuberculosis, family planning and preparedness for delivery. The households would then be supported to implement actions based on this knowledge. Women and their families would become responsible for safeguarding their own health.

The HDA organised women in groups of five (1 to 5 networks) representing the six nearest households (five members and one leader), and in larger groups, usually 30 households known as women's development groups (WDG). Supported by the local government administration and the system of command posts and steering committees, these groups are trained by the HEWs to apply all 16 of the elements of the HEP. They especially support pregnant women, and in particular encourage them to give birth in health facilities where skilled birth

attendants are available. The HDA also provides community support networks for women, helping them not only in health matters, but also in agricultural activities, and providing social, and sometimes economic, assistance. The HDA also contributes to referral linkages within the primary health care units.

Starting with the agrarian regions, the HDA is now embedded within the development structures (command posts, steering committees) that exist throughout Ethiopia, with some regional variation. By the end of 2014/15, there were over 450,000 WDGs and over 2.3 million 1 to 5 networks.

The WDG and the 1-5 networks created by the HDA have increased awareness in the community on multiple health issues, which are believed to have brought about changes in attitude, improved health seeking behaviour, increased utilization of health services, reduction in harmful traditional practices, awakening of communities to their rights and increased demands for different health services. The community, particularly the women, feel they "own" the health extension package, and are responsible for implementing it.

The WDGs identify pregnant women, inform the HEW when labour starts, call the ambulance, and ensure transport of the woman to a health centre. WDGs have also been credited with increasing the proportion of deliveries that now takes place in a health centre or hospital attended by skilled staff from 17% nationally in 2010/11 to 61% in 2014/15, by ensuring that health centres are women-friendly and overcoming traditional resistance in communities. This was achieved by provision of porridge after birth, welcoming coffee ceremonies and the construction, with community labour, of pleasantly decorated waiting rooms at the health centres. This in turn has contributed to the continuing decline in estimated maternal mortality.

Between 2009/10 and 2014/15, the work of the HDA has also contributed to increasing the proportion of pregnant women that has received at least one antenatal examination from 71% to 97%; the proportion of women undergoing a postnatal examination from 36% to 90%; and increasing the percentage of children that are fully immunised from 72% to 86%. We examined the relationship between expansion of the HDA and these

improvements. We did not, however, find any significant ($p < 0.5$) correlation, but data on HDA expansion was insufficient. Most importantly, however, membership of a WDG has been shown to significantly protect against pregnancy-related mortality.

Future development of the WDG will depend on the political commitment, successful implementation of WDGs in the towns, cities and pastoral areas, establishment of motivation mechanisms for WDGs, provision of trainings and support from the HEWs.

1. INTRODUCTION

This paper is the first product of the Health Documentation Initiative, a project of the Ethiopian Federal Ministry of Health (FMOH), which aims to document recent projects, activities and initiatives within the Ethiopian health system that are generally not well known or documented. In the past decade, health services in Ethiopia have made great strides in several areas, but many initiatives are not well known, even by health sector staff, let alone outside the country. The purpose of this Health Documentation Initiative is to increase the profile, nationally and internationally, of selected significant health initiatives. The objective is to find, analyse, summarise, and draft information on the initiatives and make it available to health managers, policy-makers, aid agencies and researchers through FMOH technical papers, national and international publications and conferences and via the peer-reviewed medical literature. The Initiative began in early 2016 and the first phase has addressed the development of Emergency Medical Services in Ethiopia (the subject of a sister paper) and the Health Development Army (the subject of this paper).

2. THE ORIGINS OF THE HDA

Coming to power in Ethiopia in 1991 after the Derg - the previous Communist government - the new government of the Ethiopian People's Revolutionary Democratic Front, headed by Prime Minister Meles Zenawi, was committed to improving agricultural productivity. Improvements were essential if the poorest country in Africa at the time was to make good progress towards a better life for most of its citizens. One of the government's development approaches was a scale-up strategy intended to disseminate the best agricultural practices and technologies (which had been piloted and proven in the country) to all farming households within a short period of time. A development force, or army, consisting of leaders at all levels, civil servants as well as the farmers themselves, was created in rural areas to implement this strategy.

¹In time, it became the Agricultural Development Army. Composed largely of men, this Army was made up of groups of local farmers who worked closely with the lowest cadre of government agriculturalists, the Development Agents.

The original intention was to make use of the development army in different areas. Such development forces, the thinking went, were capable of engaging with sectors such as education and health care, in addition to the agricultural sector. Progress, however, was slow until 2009, when the senior leadership at the Ministry of Health decided to adapt the Agricultural Development Army model for health. They conceived a way of taking health messages and actions right down to the level of the household, identifying and solving implementation bottlenecks, and building up implementation capacity which would enable households, in the years to come, to build up and maintain their own health in a sustainable manner. The senior leadership at MoH prepared a paper for discussion with the Prime Minister. They conceived of constructing a “women-centred” health system “by linking leaders at the national, regional and district levels with women’s groups in every village across the country.” Through aggressive social mobilization of the massive cohort of health extension workers and local development teams -that already existed - they were determined to bring about the fundamental grassroots change needed to achieve the MDG targets. The prime minister accepted the idea – with the proviso that they start with some pilot woredas around Ethiopia, some of which should include health interventions within the existing agriculture development team.

The pilots began in several woredas, initially in Tigray and the Southern Nations, Nationalities and Peoples Region (SNNPR) followed by pilots in Amhara and Oromia regions. Tigray was a natural choice to start. During the ousting of the Derg, which was organised from Tigray, women had organised themselves to support the Ethiopian People’s Revolutionary Democratic Front as it built itself up and then moved on Addis Ababa. After the armed struggle, the women had aspirations as well as a capacity for organisation. In SNNPR, the original pilot studies involved both sexes, building on the pre-existing community engagement that the HEP had started.

¹ Anon. (Believed to be Zenawi M.) Capacity building and Scale up Strategy, Addis Raey Magazine, 2009, Volume 2 Number 05.

Within nine months, an evaluation was carried out in which it was clear that the women's groups were out-performing the mixed groups. The women-only groups met regularly, were focused on health issues, and kept a record of their decisions and activities. The mixed groups, which tended to be male-dominated, were poor record-keepers and tended to focus on agricultural and security issues, with only some attention given to health. Moreover, the women were articulate about what they wanted. Dr Kesete presented the findings to the Prime Minister, together with the Regional Health Bureau heads. The senior leadership of the government-federal and regional level- gave the green light and the Health Development Army was on its way.

3. METHODS

This paper aims to pull together material from all possible sources in order to document how and why the HDA was set up, how it is organised, what activities it undertakes and how it coordinates with other elements of the health and other sectors. Achievements were assessed by comparing national and regional level health indicators before and during HDA expansion, as well as the results of more local assessments.

Between January and June 2016, the Documentation Team collected data from annual reports of the FMOH, and from datasets in directorates and units of the FMOH Regional Health Bureaus (RHB). Personal interviews were conducted with key staff at the FMOH and RHBs, and woreda and kebele administrations, health centres and health posts in Amhara, Oromiya, Southern Nations, Nationalities and People's Region (SNNPR), and Tigray Regions. Lastly we met with several women's development groups (WDG) in these regions and conducted semi-structured discussions.

Literature searches for the health extension programme were carried out searching on "health extension package", "health extension program(me)", "health extension workers", with and without "Ethiopia" as an additional qualifier. Further searches for the health development army used the following search terms: "women's development

groups", "health development army", "women's development army", with and without "Ethiopia" as an additional qualifier. Searches using terms for the health development army did not yield any relevant publications.

Quantitative data were entered into Excel databases (Microsoft, Seattle, Washington, USA, 2013) where they were originally in other forms and required quantitative analyses. Allowances were made for missing data and for extreme outlying data. Simple graphs and tables were prepared in Excel. Descriptive statistics such as percentage and averages were also obtained using Excel functions. Correlations between the annual numbers of 1 to 5 networks and WDGs, as markers of expansion of the HDA, and national level indicators were tested with Spearman's Rank Correlation Coefficient, a non-parametric test.

4. THE HEALTH EXTENSION PROGRAMME

The HDA is built on the foundations of the Health Extension Programme (HEP), so a brief summary of the HEP is warranted here. Before the HEP, poor nutritional status, infections and high fertility rates, combined with poor access to health services, contributed to some of the highest maternal and child mortality rates in the world. In 2005, almost all births took place at home and only 6% occurred in a health centre or hospital². The major causes of child mortality and morbidity under the age of five were preventable – malnutrition was the underlying cause in half of these deaths. Only 1% of households owned a bed net, and of these, only 18% were insecticide treated. Over 85% of the population lived in rural areas and only 40% lived within 10 kilometres of a health facility.

² Central Statistical Agency [Ethiopia] and ICF International (2005) Ethiopia demographic and health survey 2005. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ICF International.

Box 1 – The Public Health System

Ethiopia is made up of kebeles, the lowest government administrative units of about 5,000 people or 1,000 households, and woredas of about 20-25 kebeles, or 100,000 to 130,000 people. The Ethiopian public health system consists of a three-tiered health care delivery system. At the primary level, there is one health post for each kebele and covers a population of 3000-5000. Each health post is staffed by two female health extension workers (HEWs). At the next level up, a health centre (population of 15,000-25,000) covers five satellite health posts in its catchment area. Administrative, logistical, technical, and referral support to the HEWs and the health post are provided by health centres staffed by nurses and health officers and providing a range of basic curative services including basic emergency obstetric and neonatal care as well as primary care for maternal, neonatal, and child health. One Primary hospital covers populations ranging from 60,000-100,000. At the secondary level, a general hospital covers a population of 1-1.5 million and at the tertiary level, a specialized hospital covers a population of 3-3.5 million.

The number of health workers was inadequate for the population of 80 million, with doctors receiving a clinical training better suited for referral hospitals than for addressing the health problems of the majority. Health staff preferred to live in the cities.

The HEP was officially launched nationally in 2003, as a key component of the second phase of the Health Sector Development Plan, after successful pilots in Southern Tigray. The HEP aimed to provide universal access to mainly preventive, primary health care services^{3,4,5}, through more than 34,000 government-salaried

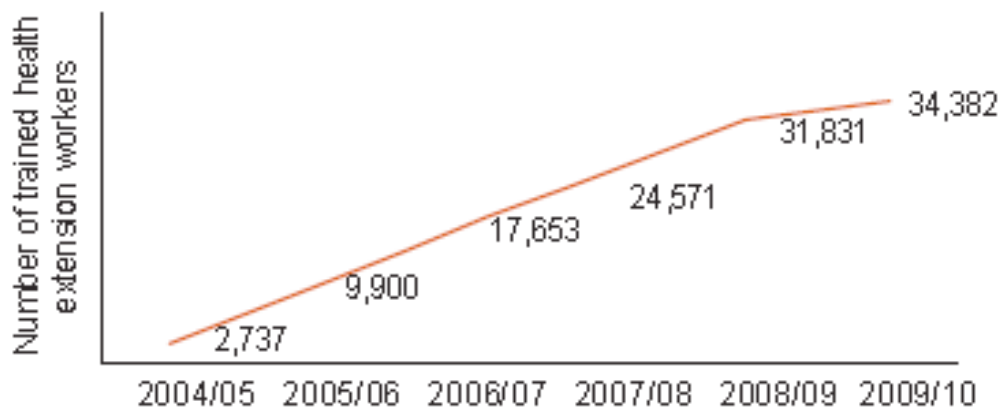
3 Koblinsky M, Tain F, Gaym A, Karim AM, Carnell M, et al. (2010) Responding to the maternal health care challenge: The Ethiopian Health Extension Program. *Ethiop J Health Dev* 24 (Special Issue 1): 105–109.

4 Wakabi W (2008) World report: Extension workers drive Ethiopia's primary health. *Lancet* 372: 880.

5 Bhutta Z, Lassi Z, Pariyo G, Huicho L (2010) Global experience of community health workers for delivery of health related Millennium Development Goals: A systematic review, country case studies, and recommendations for integration into national health systems. Geneva: World Health Organization, Global Health Workforce Alliance. Available: http://www.who.int/workforcealliance/knowledge/publications/alliance/Global_CHW_web.pdf.

female health extension workers (HEWs) – an entirely new cadre of health worker in Ethiopia, but similar to the community health workers in other low-income countries. Two HEWs were placed in a health post to serve a kebele (Box 1). The HEWs, young local women with high school education, were recruited by kebele and woreda councils and given one year of pre-service training. By 2010, over 34,000 HEWs were deployed in the field (Figure 1).

Figure 1. Annual numbers of health extension workers trained and deployed, 2004/5 to 2009/10.



Source: HSDP Annual Performance Report 2009/2010.

Initially, the HEP focused mainly on health promotion and disease prevention activities⁶ in the agrarian regions (Amhara, Oromiya, SNNPR, and Tigray) which together account for more than 80% of the total population. Variants of the HEP were promoted in pastoralist regions (Afar, Benishangul Gumuz, Gambella and Somali)

⁶ Kesetebirhan Admasu. Integrated community case management of sick children in Ethiopia. *Ethiop. Med. J.* 2014; 52, Suppl 3: Foreword.

and, later, in urban area. The HEP's underlying philosophy was to build up ownership of, and responsibility for, maintaining their own health to the households, by transferring health knowledge and skills to parents, especially mothers. Having carried out a baseline survey and prioritized the health problems of the kebele, the HEW prepared a plan which was discussed and approved by the kebele council. Initially HEWs spent 75% of their time on outreach activities: conducting household visits, educating families to adopt healthy life-styles, and organizing communities to participate in the expansion of HEP services – interventions that were shown to increase service utilisation by mothers⁷. However, after the introduction of the new rural health extension manual in 2005 E.C, HEWs spent 50% of their time on outreach services. Families or households that adopted 75% of the healthy practices were said to 'graduate' as a 'model family' household in their neighbourhood. A network of volunteers, Community Health Promoters, drawn from 'model family' households, supported the HEWs by providing essential health messages to the community. The Traditional Birth Attendants (TBAs), a cadre of health volunteers set up during the previous administration, also generally helped the HEWs by providing "clean" births, either at home and/or in the health posts. The HEWs' remaining time was spent delivering services at the health post, such as immunizations, contraceptives and uncomplicated malaria and diarrheal management. They were also trained in first aid.

The HEP package addressed hygiene and environmental sanitation, disease prevention and control and family health, particularly maternal and child health (Table 1). Not surprisingly, the greater the women's involvement in the health extension activities and planning, the greater was their use of basic health services for themselves and for their children⁸. Conversely, women that were less involved in health extension activities were less likely to take advantage of the HEP services and there was concern that it was precisely these families that would have the greater burden of ill-health.

7 Yitayal M, Berhane Y, Worku A, Kebede Y. Health extension program factors, frequency of household visits and being model households improved utilization of basic health services in Ethiopia. *BMC Health Serv Res*, 2014; 14: 156.

8 Kelbessa Z, Baraki N, Egata G. Level of health extension service utilisation and associated factors among community in Abuna Gindeberet District, West Shoa Zone, Oromia. *BMC Health Serv Res*, 2014; 14: 324.

Table 1. The 16-point package of the Health Extension Programme

A. Hygiene and Environmental Sanitation
1. Proper and safe excreta disposal system
2. Proper and safe solid and liquid waste management
3. Water supply safety measures
4. Food hygiene and safety measures
5. Healthy home environment
6. Arthropods and rodent control
7. Personal hygiene
B. Disease Prevention and Control
1. HIV/AIDS prevention and control
2. TB prevention and control
3. Malaria prevention and control
4. First AID
C. Family Health Services
1. Maternal and child health
2. Family planning
3. Immunization
4. Adolescent reproductive health
5. Nutrition
D. Health Education and Communication
A cross-cutting activity involving all of the above

Maternal and child health was a major focus of the HEP. Ethiopia was committed to reducing the under-five mortality rate to 68 deaths per 1,000 live births by 2015 in order to achieve the 4th Millennium Development Goal. Child survival strategies implemented under the HEP and provided by the HEWs included immunization, vitamin A distribution, oral rehydration therapy, distribution of bed-nets, anti-malaria treatment, de-worming and education on child health and nutrition.

Vaccine preventable diseases of children were being addressed by the Expanded Programme of Immunization, which was well established in Ethiopia prior to the HEP, but immunisation levels pre-HEP varied throughout the country. Full immunization in less than half the children was not uncommon⁹. By 2009, according to Ministry reports, 72% of children were fully immunised at the national level, although this was below the target for that year of 81%¹⁰ (yet considerably more than the 24% of children that were found fully vaccinated in the 2011 Ethiopia Demographic and Health Study (DHS)¹¹, a difference that is difficult to explain).

In any event, vaccine-preventable diseases appeared to be mostly controlled in Ethiopia, and the key killers of children under 5 years of age were, therefore, neonatal disorders, diarrhoeal disease, malaria and pneumonia, with malnutrition acting as a co-factor. HEWs were therefore trained to treat diarrhoea with oral rehydration salts, malaria with artemisin in containing treatments after a positive rapid diagnostic test, and severe acute malnutrition with ready-to-use therapeutic foods. The HEP significantly increased the proportion of households with access to improved sanitation¹². Malaria in-patient admissions and deaths in children under 5 years of age fell by 73% and 62% respectively¹³. Pneumonia cases, however, still had to be referred to the nearest health centre.

9 Gedlu E and Tesemma T. Immunization coverage and identification of problems associated with vaccination delivery in Gondar, North West Ethiopia. *East African Medical Journal*, 1997;74:239-41.

10 FMOH. Health Sector Development Programme III: Annual Performance Report 2009/2010.

11 Central Statistical Agency [Ethiopia] and ICF International. 2012. Ethiopia Demographic and Health Survey 2011. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ICF International.

12 Centre for National Health Development in Ethiopia, 2008. Ethiopia Health Extension Program Evaluation Study, 2005-2007, vol 1. Household Health Survey. Addis Ababa.

13 Otten M, Aregawi M, Were W, et al. Initial evidence of reduction of malaria cases and deaths in Rwanda and Ethiopia due to rapid scale-up of malaria prevention and treatment. *Malar J*. 2009 Jan 14;8:14. doi: 10.1186/1475-2875-8-14.

Between 2000 and 2011, under-five mortality in the country declined dramatically, from 166 to 88 deaths per 1,000 live births, but the reduction was mainly a result of fewer deaths in children one to 59 months old¹⁴, as in other developing countries. Neonatal mortality, death in the first 28 days of life, showed a more modest change, dropping from 49 to 39 deaths per 1,000 live births between 2000 and 2005, and reaching 37 deaths per 1,000 live births in 2011¹⁵. By 2011, neonatal deaths accounted for 63% of all infant deaths and 42% of all under-five deaths. In addition, in 2006 an estimated 22% of under-five deaths in Ethiopia were still attributable to pneumonia. Reducing pneumonia and neonatal mortality had become critical to achieving the 4th Millennium Development Goal.

Evidence-based essential new-born care including promotion of clean childbirth practices, clean umbilical cord care, thermal care, extra care for low birth weight babies, and early and exclusive breastfeeding were part of the HEP strategy, yet prior to 2009, the HEWs were not trained to provide it. Their knowledge of antenatal care was poor and health posts were inadequately equipped¹⁶. Furthermore, a Ministry survey of emergency obstetric and neonatal care (EmONC) in 2008 revealed significant gaps in the knowledge and capacity of nurses and midwives, and the service provision of health centres. This prompted a one year accelerated nurse and midwife training programme. Seven thousand have trained since 2009 and each health centre should now have two nurse-midwives.

A programme to equip the HEWs with skills to promote essential new-born care practices was introduced from early 2009. It significantly improved the likelihood of mothers receiving antenatal care, being prepared for the birth of their babies, receiving postnatal care and initiating breastfeeding immediately after birth. There was a

14 Oestergaard MZ, Inoue M, Yoshida S, Mahanani WR, Gore FM, et al. (2011) Neonatal mortality levels for 193 countries in 2009 with trends since 1990: A systematic analysis of progress, projections, and priorities. *PLoS Med* 8(8): e1001080. doi:10.1371/journal.pmed.1001080.

15 Central Statistical Agency [Ethiopia] and ICF International (2011) Ethiopia demographic and health survey 2011. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ICF International. 109–112. Available: <http://www.measuredhs.com/pubs/pdf/FR255/FR255.pdf>.

16 Medhanyie A, Spigt M, Dinant G and Blanco R. Knowledge and performance of the Ethiopian health extension workers on antenatal and delivery care: a cross-sectional study. *Human Resources for Health*, 2012; 10: 44.

dose-response relationship between the HEP and better care practices¹⁷, implying that it was indeed the HEP that had caused the improvement, however, the probability of having a birth attended by a skilled health worker did not increase^{18,19} and pneumonia mortality remained high. When mothers themselves were asked about their experiences of the HEP, they usually expressed satisfaction, but they also criticised the HEWs for not providing curative services, and being insufficiently competent to answer to all their needs²⁰. Therefore, in 2010, the national integrated community case management (iCCM) programme was launched to deliver straightforward curative interventions, particularly antibiotics for pneumonia, at health post level to sick children in Ethiopia.

Maternal mortality was another key concern for the Federal Ministry of Health. In 1990 an estimated 1,250 women died for every 100,000 live births – one of the highest maternal mortality rates in the world at the time. By 2011, it had been nearly halved to 676 maternal deaths per 100,000²¹, but still this was disturbingly high - with an average of nearly 5 pregnancies carried to term per woman, over 3% of Ethiopian women could expect to die in childbirth²². The rate of acceptance of at least one antenatal visit was 71% by 2009, but only 36% of women underwent a post-natal examination. (Corresponding figures in the DHS, 2011, were 34% and 7%, respectively, perhaps because the Survey defined both antenatal and postnatal examinations as those carried out by a doctor, nurse or midwife, rather than an HEW). Contraceptive use had increased nine-fold between 1990 and 2011, when 27% of women were using modern methods, and this was partly attributed to the network of HEWs²³.

17 Karim AM, Kesetebirhane A, Schellenberg J et al. Effect of Ethiopia's health extension program on maternal and newborn health care practices in 101 rural districts: a dose-response study. *PLoS One*; 8; e65160.

18 Medhaniye A, Spigt M, Kifle Y et al. The role of health extension workers in improving utilization of maternal health services in rural areas of Ethiopia : a cross-sectional study. *BMC Health Serv Res*. 2012; 12: 352.

19 Mesgenaw F, Kestebherhan A, Alemayehu M et al. Effect of an innovative community-based health program on maternal health service utilization in north and south central Ethiopia: a community-based cross-sectional study. *Reproductive Health* 2014; 11: 28.

20 Birhanu Z, Godesso A, Kebede Y and Gerbaba M. Mothers' experiences and satisfactions with health extension program in Jimma zone, Ethiopia: a cross-sectional study. *BMC Health Service Res*. 2013; 13: 74.

21 Ref. 12. Central Statistics Agency, Ethiopia and ICF International, 2012.

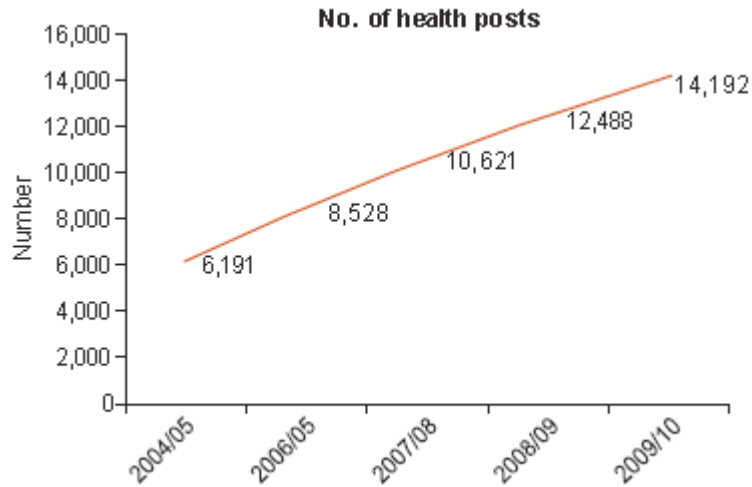
22 Olson D and Piller A. Ethiopia: an emerging family planning success story. *Stud Fam Plann*. 2013; 44: 445-459.

23 Ibid.

However, the most important intervention in preserving mothers' lives in pregnancy, as well as contributing to improvements in neonatal outcome, was to ensure that skilled help was available during delivery, yet, in the five years up to 2011, 90% of Ethiopian mothers were still delivering at home. Among mothers surveyed in the 2011 DHS, 61% said they thought skilled attendants at the birth were "unnecessary". In 2010, therefore, the policy was instituted to encourage all mothers to deliver at health centre level where skilled attendants (doctors, midwives or nurses) at the birth could be assured.

By 2010, it was clear that the HEP had achieved several measurable successes, but some elements required improvement. Health centres had been built in all but the most remote parts of the country (Figure 2), and now service utilization needed to increase. Curative services needed to be provided for common, potentially serious childhood infections, particularly pneumonia, and it was hoped that iCCM would address this. Better antenatal care, with prevention of HIV transmission from mother to child was needed. In the interest of safer deliveries, all the barriers to having a birth in a health centre or hospital, attended by skilled health workers, needed to be removed. Better organization of the community to help ensure mothers could get to a health centre for delivery, was required²⁴. The high drop-out rate from immunization programmes had to be reduced. If the number and quality of model households could be increased, it would positively impact many aspects of health. If the women themselves could see the advantages of using the health services that were available, and themselves become engaged in ensuring that the community took steps to improve its health, then they would significantly increase their use of the services, and become a massive force for positive change. Health could be promoted and diseases prevented at the level of every household. The model family initiative that utilizes the diffusion of innovation theory had achieved great improvements. However it had its own limitations vis. a vis. the desired speed of change and inclusiveness of the poor and marginalized. This was the rationale for the HDA, which was finally piloted in 2010.

24 Gebrehiwot T, San Sebastian M, Edin K, Goicolea I. Health workers' perceptions of facilitators of, and barriers to, institutional delivery in Tigray, Ethiopia. *BMC Pregnancy Childbirth*, 2014; 14: 137.

Figure 2. Cumulative numbers of health posts constructed in Ethiopia, 2004/5 to 2009/10.

Source: FMOH 2009.

The Ministry recognised, however, that the HDA would be insufficient on its own to make the necessary change to the key indicators, maternal and neonatal mortality. Women themselves had clearly stated that the barriers to access of health services included the lack of transport, which they considered a bigger barrier than the lack of money or the distance to the nearest health centre. A massive increase in ambulance provision was therefore also planned and 1,261 ambulances were distributed nationwide between 2010 and 2012²⁵.

²⁵ FMOH. Development of the Ethiopian emergency medical services – a situational analysis. In press.

5. HOW THE HDA WAS SET UP

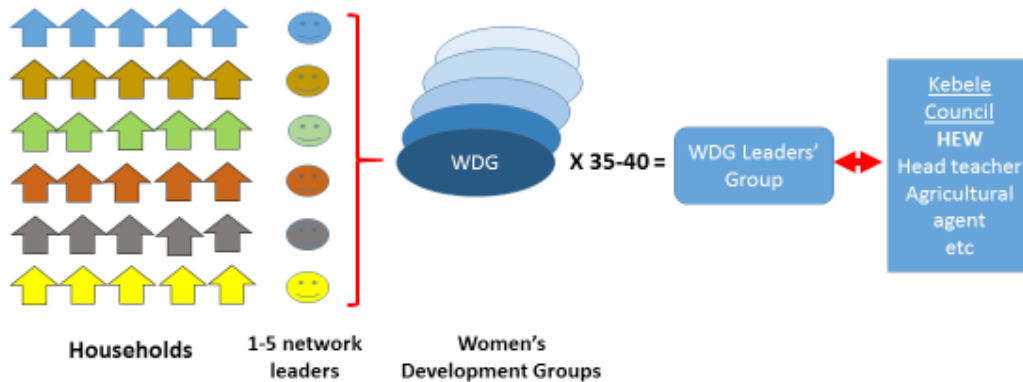
During 2010, initial training began for the core team at the FMOH that was to be responsible for developing the HDA. The training was based on the male-focused Development Army material designed for agriculture²⁶. The team then took just few months to write the specific HDA training material. Some regional health bureau heads and deputy heads also participated in the manual development. The focus was on empowering women to take responsibility for their own health and that of their families, especially the children. The means to achieve this were to organise women into formal groups that became known as Women's Development Groups (WDGs), with the ambitious intent of involving all women in the country, including those that previously had not been involved in health extension activities. The WDGs were to be politically and administratively supported by the kebele command post; especially kebele administrations, kebele managers, the Women's Affairs representative at kebele level and the HEWs. The Regional Health Bureaus were to ensure support from the regional level, through the woredas to the kebeles, thus linking the aspirations of the women themselves with the drive for development that was taking place throughout Ethiopia.

The Health Extension Workers (HEW) were already the bedrock of the HEP and were to be the lynchpin in establishing the WDGs. They were the interface between the women and the health system²⁷, and were to provide the initial training for the WDGs. Motivation for this extra work was unlikely to be a problem because the WDGs would undertake much of the educational and home-visiting work of the HEWs. In some areas, particularly Tigray Region, local women's societies, such as the Women's Association were also involved. Rapid expansion took place during 2010-2011, and by mid-2012, the four largest regions, Tigray, SNNPR, Amhara and Oromiya had made significant progress in establishing the HDA (Table 2).

27 Jackson R, Tesfay FH, Godefay H, Gebrehiwot G. Health extension workers' and mothers' attitudes to maternal health services utilization and acceptance in Adwa woreda, Tigray Region, Ethiopia. *PLOS One*, 2016; 11(3):e0150747. Doi: 10.1371/journal.pone.0150747

The HDA therefore has three components, the women themselves, organised into development groups, the health service providers, exemplified by the HEWs, and the local government, represented by the kebele council and administrator at the peripheral level. Each women's development group (WDG) consists of 25-30 women, and these in turn are made up of groups of women from just 6 households – the “1-to-5 networks” (Figure 3). In some areas, any woman over the age of 18 is encouraged to engage with the networks, while in others, married women only are admitted. The leaders of the 1-to-5 networks receive initial training by the HEW with the technical support of the health centre. This training is on the health extension package and takes around 60 hours. The main topics covered include family planning, nutrition, adolescent reproductive health, maternal health, immunization, prevention of malaria, tuberculosis, HIV/AIDS and other STDs, first aid, personal and environmental health, solid waste management (handling, sorting, disposing), safe water and food; and how to construct a latrine and its proper utilization²⁸. The ‘model family’ training included more in-depth information on maternal, new-born and child health care practices than had previously been included in the HEP. These 1-to-5 leaders then, in their turn, provide training to the women in their networks.

28 FMOH, 2003 Annual Plan, November, 2010.



The HDA in Tigray is often referred to as the Women's Development Army. Expansion of the HDA was not only due to organisation “top-down” from the Regional Health Bureau (RHB), but it also drew on the aspirations of women for better health for themselves and their children. These grew out of the empowerment and organisation of women by the liberation struggle. During the struggle, several women's organisations were set up at kebele level, and also afterwards in response to the 1998 National Women's Policy. These included the Women's Association, the Women's League, and the Women's Federation as well as the Women's Affairs departments of local government. The Women's Association is a civil society association, the Women's League belongs to the political party, and the Women's Federation and Departments of Women's Affairs are the government organs. The Women's Association is structured from the region to the kebele level and takes the leading role in organizing women in some regions (e.g. Tigray), while in others it is more the Women's Federation that takes the lead role (e.g. SNNPR). There are also differing degrees of participation from the Women's League and representatives of the Women's Affairs departments of local government. These societies were all involved to some extent in the rise of the HDA in the regions. However, there was local variation. For example, in some villages, the health

development group began with both men and women, but usually they were eventually advised by the HEWs to set up women's only groups. Nowadays the Women's Affairs departments of local government seem the most influential in guiding the WDGs.

In Amhara, the HDA was started in 2010 by direction of the Government. All zonal leaders were trained on the plans for setting up WDGs by regional staff, members of the Women's Affairs Department, and the Women's Association, following the successful experience in Tigray, and an equally successful pilot in Amhara itself. Training cascaded rapidly down to woreda and kebele level. In the kebeles, the HEWs with the kebele administration led the way, initially explaining the benefits of organization to the women with involvement also of the kebele administration, including staff of the Women's Affairs Department, and frequently, members of the Women's Association. This was followed by training on the health packages of the HEP.

Nevertheless, expansion in the first two years in Amhara was slow owing to resistance from both the men and the women themselves. The women were "busy at home", nervous of getting engaged without their husbands' permission and entirely unused to speaking in public. The (mainly male) Development Army, which focuses on agriculture, was called together to have the benefits of the HDA explained. Finally, acceptance came with appreciation of the advantages of the HDA. In West Gojjam zone, the most important decider was the building of latrines. With defecation in the open field the accepted norm prior to the advent of the HDA, women felt particularly exposed, and restricted defecation to the early morning and night time. Construction of community latrines and, even better, household latrines, removed this problem. Girls benefited similarly by the construction of latrines in the schools. The work was carried out by the community, with the husbands doing the digging.

In SNNP, the HDA was started in 2010 based on the Agriculture Development Army model that was mostly male but involved women as well. However, this did not achieve the expected results, so in 2011 the Southern Region RHB sent a team to Tigray to see how things were organised there. Based on this experience, SNNPR developed a guideline and a way of organizing the WDGs that relied on collaboration with the Department of Women's

Affairs. Once the WDGs were organized, training on the health extension packages was given to members of the group.

In Oromiya, the HDA was brought into being by the health extension workers and command post (see Section 6) members. First, members of the command post, especially the political party representatives, convinced each woman in the kebele to attend the training that focused mainly on the 16 elements of the health extension package, and the potential benefits of organization. Supported by the woreda and professionals from the Health Centres responsible for each kebele, the HEWs and representatives of the Women's Affairs Departments provided the training. Following these training sessions, the HEWs, often supported by other command post members, have continued to organize the interested women.

6. ORGANIZATION AND WAYS OF WORKING OF THE HDA

6.1 The organization of the HDA

One of the principal aims of the HDA was to have the women identify the important local bottlenecks that hinder families from utilizing key services and implementing the HEP, and to prioritize those that they want to address as a team; then come up with feasible strategies to address these problems, implement the strategies, and evaluate their activities. This requires organization. At the base, the 1-to-5 networks selected a leader from among themselves. These networks, of which 4 to 6 were grouped into a WDG, also each elected a leader from among their number (Figure 3). The chief criterion for being a leader is that the woman has achieved all or most of the targets for her household to be nominated a model household. She should have the ability to influence and convince other women to take actions on health issues. Furthermore the leader should have the ability to lead, should be trusted by the community and be willing to serve her community as a volunteer. Literacy is

often an additional criterion. The WDGs meet together twice per month on fixed days with the HEWs. During these monthly meetings they specifically report on progress in implementing their plans, receive feedback and prioritize their activities. There are three kinds of plans. A household (individual) plan, the 1-to-5 network plan and the aggregated or WDG plan.

The one-to-five networks meet most frequently- 2 to 3 days per week - since they are neighbours living in close proximity, but they are supposed to meet formally at least once per week. In West Gojjam, Amhara Region, for example, the 1-to-5 networks meet officially 3 times per week. In all regions, the WDG leaders meet the 1-to-5 network leaders twice per month. The WDGs meet the HEWs as needed, though usually, the WDGs meet the HEWs twice per month. In some kebeles, the HEWs convene a meeting of all the WDG members every three months. The other scheduled big meeting day is the pregnant women conference day. This conference day was originally initiated by the women themselves. Principally it addresses the needs of pregnant women and is conducted once a month. WDG leaders are required to bring pregnant women in their groups to the conference and the health centre workers provide training to the pregnant mothers.

“The idea behind working with the WDGs is to empower the women and ensure they benefit from all aspects of development, economical, social, political – as well as health”²⁹. Therefore, the kebele administrator and representatives from the development sectors (health, education, agriculture, and water) also play a role in the functions of the WDGs. However, the work of the WDGs in all regions is very local, just up to the level of the kebele.

While the theoretical structure of Steering Committees and Command Posts exists from the kebele level up to the Regional Bureau, there is significant regional and local variation in the way it works. In Tigray, for example, the command post includes the highest officials drawn from the political party and representatives of government departments addressing women's affairs, education, health, agriculture, water and energy. It is the most powerful

29 Hagos Godefay, Head of Tigray RHB. Pers. Comm. April 7 2016.

structure of the local government. Hence, at regional level, it is normally headed by the vice president of the region, at the woreda level it is headed by the woreda administrator, and similarly at kebele level it is headed by the kebele administrator. With respect to the HDA, the command post focuses on supporting and leading, ensuring its establishment and supporting the steering committee in its health-related activities. The steering committee, on the other hand, is composed of representatives drawn from agriculture, education, water and energy, health, women's associations and women's affairs. The steering committee is a technical committee. From regional to kebele level, the chairperson and the secretariat of the steering committee are assigned from women affairs and the health sector, respectively. The main roles and responsibilities of the steering committee are preparing plans, defining good development practices and disseminating them, particularly through the WDGs. The Committee monitors and evaluates, reports to the command post and ensures capacity building to the kebeles. The widespread nature of the WDGs means that new ideas or practices can diffuse rapidly through a region.

In SNNPR, the activities of WDGs are coordinated by the steering committee. The regional health bureau deputy head is a member of the steering committee and s/he is responsible for all health related activities including WDG. The women's structures (Women's League, Federation, Association and Department of Women's Affairs) are part and parcel of the steering committee. In this region, unlike other regions, the WDGs also participate in small business and income generating activities so that microfinance institutions are one of the members of the steering committee. There are multiple sectoral command posts in the SNNPR, for agriculture, education, health etc. There is also a cluster command post, monitoring and evaluating activities in each sector.

Like in SNNPR, there are two kinds of command post in Amhara, too, with sectoral command posts and a command post that evaluates and leads all the developmental sectors. In Amhara, there is also the "Timeret committee" which is equivalent to the steering committee. At the kebele level the chairperson of the "Timeret committee" is the school director, and the secretariat is the HEW, while at zone and woreda level it is headed by the Women's Affairs director and the secretariat is from the health sector. These "Timeret committees" at kebele level evaluate the WDGs and grade them A, B, or C.

In Oromiya, similarly to other regions, the command post leads, supervises, evaluates and supports the WDG with a structure that extends from the region down to the kebele. The command post meets once a week. However, there is no dedicated steering committee for the HDA at the kebele level.

6.2 Activities

The 1-5 networks meet frequently, officially and unofficially, since they are neighbours. They discuss health issues and the material provided by the HEWs, sharing problems in implementing interventions and developing ideas, which they can then share with their WDGs. The WDGs work closely with the HEW at the level of the Health Post, to ensure the application of measures in their households and villages to improve maternal and child health, water safety and hygiene as well as disease prevention and control, in other words, the health extension package (Table 1). The activities they undertake to address these areas are discussed, and responsibilities are designated, at the monthly or bi-monthly meetings of the WDG leaders and the HEWs.

The HEP was conceived at national level, with its overall objectives and indicators defined there, with some modifications over time. The targets of the HEP are set at national and regional level, taking into account the needs and wants expressed by women's groups. The linkage of the HDA with the HEP has resulted in a set of objectives and activities that generally coincide with the aspirations of the women, but also address the plans and strategies of the government. One senior health leader added, ***"...the intention of initiating this innovation is not to engage and directly pressure the women to implement the plan cascaded from the top. The decisions taken by WDGs are up to the women."*** Productive interaction of government organs with the women's groups probably requires quite a light touch.

Unsurprisingly, maternal health is a key issue for the women. The women themselves identify those who are pregnant and report the expected date of delivery (EDD) to the HEW. Many HEWs keep a chart on the wall of the health post that records all the women known to be pregnant, their EDD, the name of the husband, the name of

the WDG leader, the name of the kebele council member responsible for that area, and the name of the individual who will be responsible when labour starts, if different from the husband.



The terrain in Ethiopia creates particular difficulties in delivering health services and no more so in getting mothers in labour to hospital – a key goal of the HDA. In rural areas, the EDD is therefore communicated to the youth group in areas where the “traditional ambulance” (a modified stretcher) may be required to take a mother in labour to the health post or centre, or to a rendez-vous point on the road where they can meet the motorised ambulance. In Tigray, the mothers themselves have

redesigned the traditional ambulance to make it more suitable for women in labour and to reserve it specifically for that use. The local/original name for the unmodified traditional stretcher was “Kareza”. Mothers did not wish to use the Kareza as Kareza usually associated with poor health outcomes. The leaders of the WDG usually have a mobile telephone - where there is coverage - and can call the HEW and the motorised ambulance when needed. In Tigray, but not so far elsewhere, a 100 ETB mobile card is given to the HEWs every month to support their communications with WDGs, especially when there is a labouring mother. The WDG leaders carry out household visits to grade and provide support the houses on the performance of the health extension activities.

“... knowing women who have died in childbirth, and realising their own effectiveness in preventing this from happening, by encouraging deliveries in health centres, was ... the most important incentive to work together in their WDGs.”

The women's groups contribute their ideas and resources to make the objectives work. The most-quoted example is that of the objective of increasing the proportion of births that take place in a health facility, attended by a skilled birth attendant. This indicator only really took off once the women had made it clear that achieving it requires ensuring that

porridge, culturally viewed as a necessity by mothers to defend them and their infants from adverse outcomes, is made available in the health facilities for mothers once they deliver. The availability of resources for coffee ceremonies and for feeding waiting mothers prior to labour were additional incentives for institutional delivery. The women themselves donate 1-3 kgs of cereals at harvest time, or sometimes ETB 10-20 per month, to provide the ingredients for these simple inputs, and the health centres provide the space.

The women also pressed for the construction of waiting rooms at health centres for women who are approaching their EDD but live some distance away – and for women in labour, who on arrival at the health centre found their labour had stalled. In the rural areas, these rooms are mostly built entirely by community labour, and are fitted out with local style beds or mattresses, decorated as the women want, often with a television to help pass the time.



With respect to access to maternity services, the absence of husbands, due to farming at a distance, is an obstacle for mothers-to-be. Other members of the mother's 1-to-5 network will often help with looking after any children remaining at home, and with any essential farming duties. It is the women themselves who are now addressing traditional and cultural barriers to delivering in health centres, such as the fear of meeting other pregnant women, and discouragement from mothers and mothers-in-law who delivered their own children at home. Women have also reported experiencing disrespectful care³⁰, and have asked health managers to improve the way staff deal with women, in hospitals, particularly.

30 Jackson R. Ibid.

Finally, knowing women who have died in childbirth, and realising their own effectiveness in preventing this from happening by encouraging deliveries in health centres, was identified in all the women's groups met by the authors as the most important incentive to work together in their WDGs. They all knew relatives or friends who had died in childbirth, or of children who had succumbed to an infection. Women said with pride that since setting up their WDGs there had been no maternal deaths, or no child deaths in their area.

The WDGs address educational, justice, governance and agricultural issues too, although the bulk of their work is on health and health related issues. For example, they are likely to be approached by the school if children fail to turn up for classes. They interact with male development groups whose focus is agriculture. One particular interest of some women's groups is improvement in the quality of seeds. In some villages, the women contribute ETB 10-20 per month to support the poor.

In the planning process, the gaps and problems are identified at woreda level, and these are then prioritised at the regional level. Women are asking for health information and promotion materials from the health system and giving feedback on their content, although formal pre-testing of such material has not involved the WDGs – as yet.

In all regions there is a supportive supervision of the woredas by the region occurring every three months focusing on the HEWs and WDGs plans and performance. There is “integrative” supervision every six months, which is more extensive, looking at health in general and including capacity building. These can take up to 40 days. As one official in Tigray put it ***“during the visit we are also checking the reliability of the data by randomly selecting 10-20 households in each kebele and verifying the grade point (A, B or C) given by the WDGs. We also compare the family folder with the registration card kept in the health post.”*** Furthermore, the FMOH conducts integrated supportive supervision at least once a year. During this supervision WDGs and households are visited.

7. ACHIEVEMENTS

7.1 Expansion of the HDA

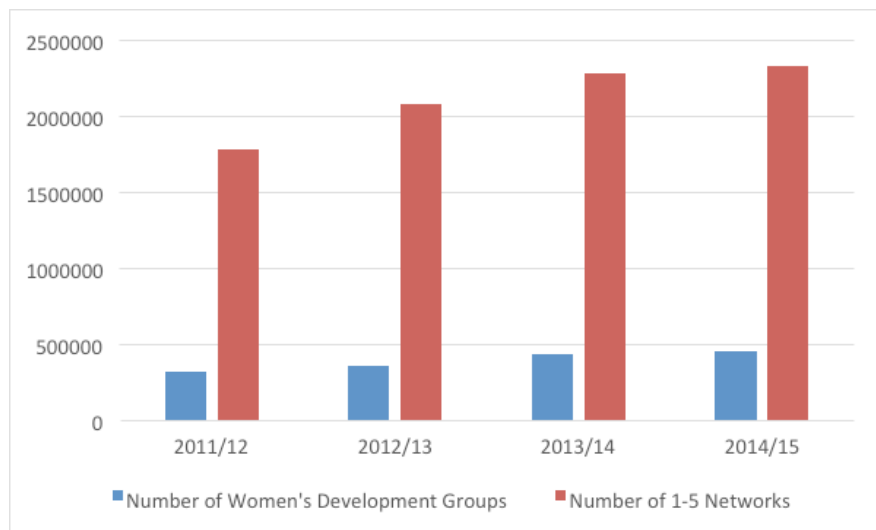
Initially, establishment of the 1 to 5 networks and WDGs focused on the agrarian regions and Addis Ababa. The rise in networks and WDGs was extremely rapid in 2010 (for which, unfortunately, there are no data) and 2011, followed by a gentler rise and plateau (Table 2 and Figure 4). Other cities and the pastoral regions were phased in later. Numbers go down as well as up, eg in the 1 to 5 networks in Addis Ababa in 2013/14 which reflects the attempt by reporting authorities to grapple with the problem of “non-functioning” groups and record only the number of groups that were actually functioning.

Table 2. Expansion of Women's Development Groups (WDG) and 1 to 5 networks, 2011/12 – 2014/15. NB data in bold indicate officially reported, but improbable results, where it appears the same numbers have been reported in two consecutive years.

Region		2011/12	2012/13	2013/14	2014/15
Tigray	WDG	25,000	27,320	29,849	30,206
	1 to 5	124520	125000	149245	152095
SNNPR	WDG	76557	76557	84129	84871
	1 to 5	485771	485771	629953	434285
Amhara	WDG	84285	109725	118625	121445
	1 to 5	379988	539693	572802	600559
Oromiya	WDG	140643	147428	195864	195864
	1 to 5	912712	732259	880975	880975
Addis Ababa	WDG	-	-	10407	10634
	1 to 5	99850	128815	41561	62556
Harari	WDG		966	1613	1609
	1 to 5		4706	5510	9658
Dire Dawa	WDG		2074	2286	2221
	1 to 5		10230	12695	13920
Benishangul	WDG				6253
	1 to 5				168135
Gambella	WDG				1037
	1 to 5				13376
National	WDG	326,485	364,070	442,773	454,140
	1 to 5	1,790,129	2,026,474	2,292,741	2,334,559

Source: FMOH Annual Performance Reports.

Figure 4. Expansion of Women's Development Groups (WDGs) and 1 to 5 networks, 2011/12 – 2014/15.
Same data as in Table 2 in bar chart form.



7.2 Qualitative results

Health officials from regional, through zonal, down to woreda and kebele level are quick to point out the achievements of the HDA, although documentation is more difficult to find, and distinguishing between the HDA's results and those of other components of the health system is challenging. In reality, results in the health sector are dependent on a chain of systems, and the HDA is only one link. On the other hand, situated at the base of the health pyramid, the relatively small actions by the 1 to 5 networks and the WDGs can have massive cumulative effects further up the health system, for example on health service utilization. "...the WDGs

31 Tigray Regional Health Bureau. Ten Years Health Bulletin (EFY 1998 - 2007). November 2008 E.C., Mekelle, Ethiopia.

... contribute immensely to the health sector as well as other development areas through their communication and mobilization capacity. WDGs are the cornerstone of community ownership in Tigray, creating demand for health, wellness, and improved access to health care services through organized voluntary groups of women."³¹ The integrated community childcare management (iCCM) programme depends, for example, on the HDA to disseminate information on how to care for sick children, especially those with diarrhoea, pneumonia, malaria, measles and malnutrition.

Apart from the women and children themselves, the HEWs benefit most from the HDA. Their interaction with WDGs enables the HEWs to have an impact on household practices and to disseminate their advice and guidance right down to household level. ***"The WDGs are the right hand of the HEWs"***, according to a member of the Health Promotion and Prevention case team in Tigray RHB, who added that the HEWs' response to the formation of the HDA was, ***"Now the government has woken up."***

In the authors' discussions with RHB staff in the four agrarian regions, they identified several areas where the HDA had been particularly crucial.

- The WDG and the 1-to-5 network meetings and discussions create awareness in the community on multiple health issues, which are believed to have brought about changes in attitude, improved health seeking, behaviour increased utilization of health services, reduction in harmful traditional practices, awakening of communities to their rights and increased demands for different health services. The community, particularly the women, feel they "own" the health extension package, and are responsible for implement it.
- These outcomes in turn have led to improvements in maternal and child health, hygiene and sanitation, and communicable disease control:
 - In maternal health, more women now attend ANC, pushed, perhaps, by the WDGs. Complications of

31 Tigray Regional Health Bureau. Ten Years Health Bulletin (EFY 1998 - 2007). November 2008 E.C., Mekelle, Ethiopia.

pregnancy have been reduced. More deliveries take place at health centres and hospitals. In Oromiya, for example, TBAs have been brought on board to support facility deliveries. Improved take up of postnatal examinations have reduced post-partum complications. Nutrition of pregnant women has improved, and, in consequence, the chance of having an underweight or malnourished child, reduced. Birth spacing has been improved by increased use of contraceptive, and, in turn has improved child health. Immunization rates of children have increased.

As one HEW put it, ***“many women were discouraged to immunize their children because of fearing the fever after vaccination. If their children had fever in the first vaccination they did not go back to the health post for the next vaccination. However, thanks to the awareness created by the WDG now women understand fever is the reaction of the immunization. Contrary to older days now women worry if their children haven't fever after immunization since they consider having fever after vaccination is a sign of potency.”***



There is improved exclusive breast feeding up to six months and complementary feeding afterwards, less harmful practices related to child feeding, and more mothers now seek modern medicine for their ill children. Children's personal hygiene and sanitation practices have improved, and childhood communicable diseases such as eye disease and diarrhoea are less common. Birth weights are increasing.

- In environmental sanitation, the number of open defecation free kebeles has increased through constructing common and household latrines. Initially there was resistance to latrine construction. As one HEW observed:

“In Oromiya, in Teio woreda, Dosha kebele, women were the first eye openers to show the construction and benefits of latrine. Initially males were not willing to do the digging. Therefore, most of the first latrines in the kebele were constructed by the women themselves. After seeing the women's activity and benefits of the latrine males were also motivated and started to construct. Currently every household in the kebele has a latrine and most of the latrines are up to standard”.



Communal latrine, Left to right SNNP Region, Gurage zone and Amhar Region, East Gojjam zone

- In communicable disease control, WDGs have eliminated malaria breeding sites in Amhara and Tigray and participated in spraying of households. They have also increased the use of bed nets by teaching about them, distributing them, and then following-up the households to ensure they are used. WDGs have increased identification of TB cases. In almost all regions, the WDGs identify individuals coughing for more than two weeks and either advise the patient to

see the HEW or go to the health centre for a sputum smear. The proportion of TB patients that properly takes TB drugs has gone up. Once a person starts TB medication, the WDG, in collaboration with the HEW, follows them up. In HIV there has been an increased awareness of HIV transmission mechanisms and more mothers-to-be tested for HIV.

The specific example of West Gojjam zone in Amhara Region, with both qualitative and quantitative results, is given in Box 2.

Box 2**Achievements of the HDA in West Gojjam, Amhara Region***

- 271 out of 363 villages are “open defaecation free”.
- Reduced levels of trachoma.
- Increase in “skilled birth attended” (SBA) deliveries from 9% to 68% between 2009/10 and 2014/15.
- Waiting rooms for mothers who are nearing their expected dates of delivery (EDD) constructed in many kebeles, usually through the contribution of community labour.
- Postnatal examination attendance within seven days of birth increased from 26 to 99%.
- Immunization rates increased from 86% to 96% with the efforts of the WDGs. Before the HDA, immunization campaigns were costly, took around 10 days and achieved 75-80% coverage. Men had to be employed to carry vaccines and cool boxes. Nowadays the women do this for free, the campaign lasts 3 days and the coverage is 100%.
- Malaria incidence significantly reduced by elimination of breeding sites by the 1-to-5 networks, increased use of ITNs distributed by WDG leaders themselves, and greater acceptance of indoor residual spraying.
- Villagers suspected of tuberculosis identified by WDG members and sent to health post for sputum smear. WDG leaders ensure patients take whole course of treatment.
- Women instrumental in creating discussion at community level on HIV and AIDS, increasing awareness and diminishing stigma.

- Antenatal testing for HIV 100%, and prevalence rates decreased from 2-3% to almost zero.
- Contraceptive acceptance rate – among those not wanting to get pregnant - increased from 20% to 100%. Long-acting contraception increased from 2% to 35% in last 5 years. Whereas prior to 2010 contraception regarded as sinful, now it is accepted, largely due to female pressure. Kebeles involved religious leaders, but their wives had already persuaded them that contraception was not immoral.
- HEWs spend less time on household visiting and are freed up to provide curative and immunisation services at health posts. No measles outbreaks since 2009.
- HEWs' advice on a balanced diet and need to increase food intake in pregnancy has improved nutrition status of mothers.
- Exclusive breastfeeding for the first 6 months of infants' lives has reduced rates of malnutrition.
- The zone plans to buy 35 ambulances with funds from the Community Health Insurance Scheme and monies collected by the women.

*Interview with Ato Liyew Wundemenh, Health Department Head, West Gojjam Zone, 20 May, 2016

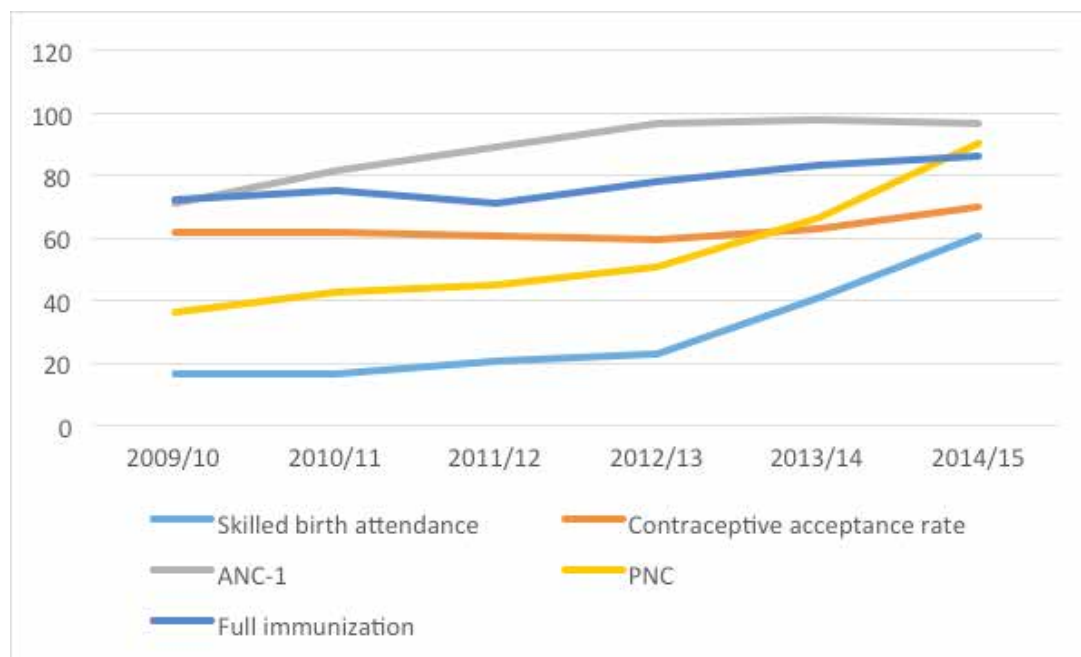
7.3 National level quantitative assessment

We have looked at the national level indicators that would be expected to show the greatest impact as a result of HDA activities (Figure 5). Skilled birth attendance and postnatal examination coverage both increased markedly in the six year period after the introduction of the HDA, increasing slowly at first and then really taking off in 2013/14 and 2014/15. The increase to 60.7% of all deliveries taking place in a health centre or hospital in 2014/15 is remarkable, given that in the five years up to 2011, 90% of Ethiopian mothers were delivering at home. By 2014/15, 90% of mothers were undergoing a postnatal examination within seven days of delivery. Full immunization of children and contraceptive acceptance rate have also increased, although not as dramatically.

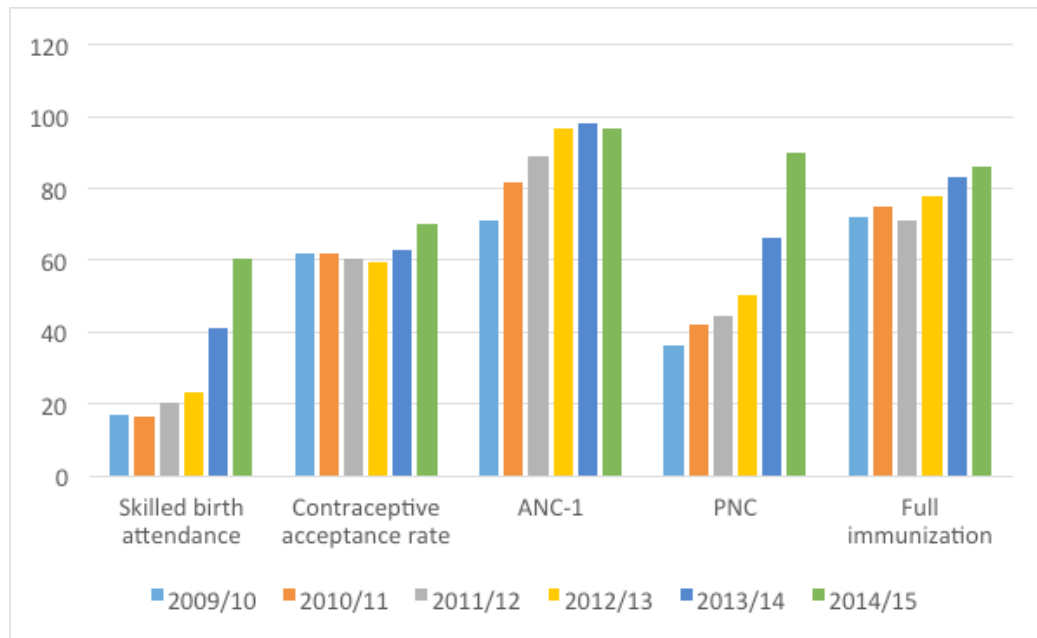
The proportion of mothers-to-be undergoing at least one antenatal examination has increased from 71% in 2009/10 to 97% in 2015/16.

Figure 5. National level key outcomes of maternal and child health, 2010-2015, a) by year, and b) by outcome. ANC-1 = at least one antenatal care visit with a health professional, PNC = at least one postnatal care examination within 7 days of delivery.

a)



b)



Source: FMOH Annual Performance Reports and Annual Health and Health-Related Indicators documents.

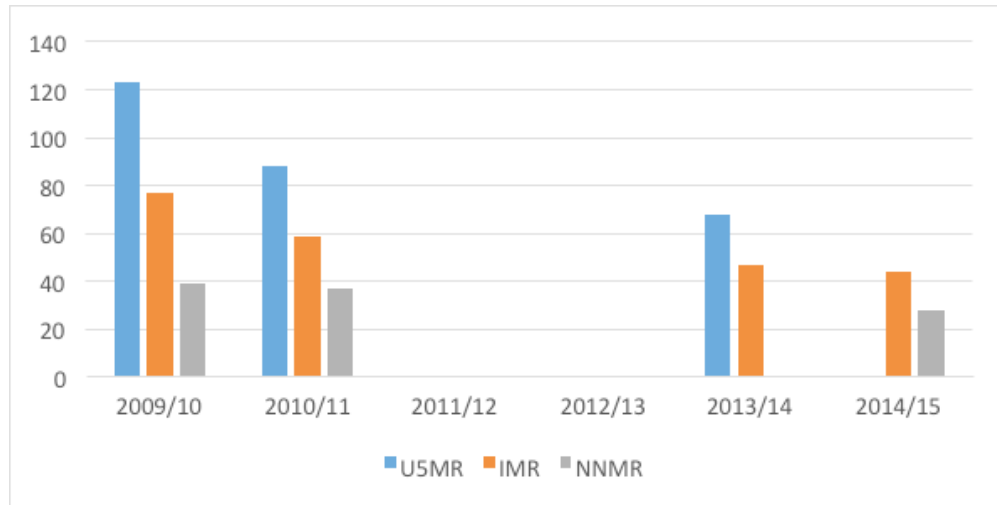
With respect to measuring impact, at this point in time (2016), before vital registration is applied throughout the country, mortality indicators can only be estimated. In 2011, the maternal mortality ratio was estimated by the Ethiopian Demographic and Health Survey (EDHS) at 676 maternal deaths per 100,000 live births, which is statistically indistinguishable from the 2005 EDHS result of 673 per 100,000 live births. However, a more recent estimate yielded a maternal mortality of 420 per 100,000 live births³². The extent to which this is significantly

32 World Health Organization, UNICEF, UNFPA, The World Bank, United Nations Population Division. Trends in maternal mortality: 1990 to 2013. WHO, Geneva, 2014.

different from the previous estimates is uncertain, and the contribution made to this reduction by the HDA even more so. However, the trend is in the right direction.

For the under-five, infant and neonatal mortality rates, likewise, only estimates are available (Figure 6). These are all showing changes in a downwards direction, with the greatest improvements in the older age ranges.

Figure 6. Changes in estimated childhood impact indicators, U5MR = under 5 mortality rate, IMR = infant mortality rate and NNMR = neonatal mortality rate.

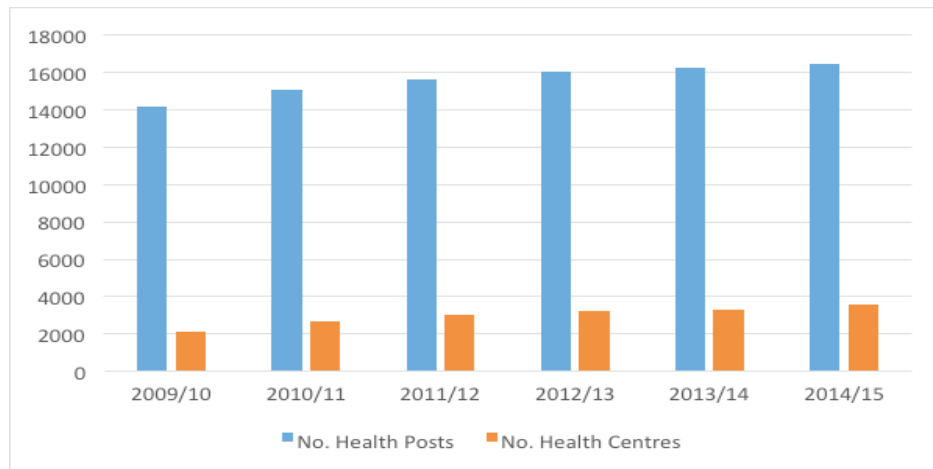


Source: FMOH Annual Performance Reports and Annual Health and Health-Related Indicators documents.

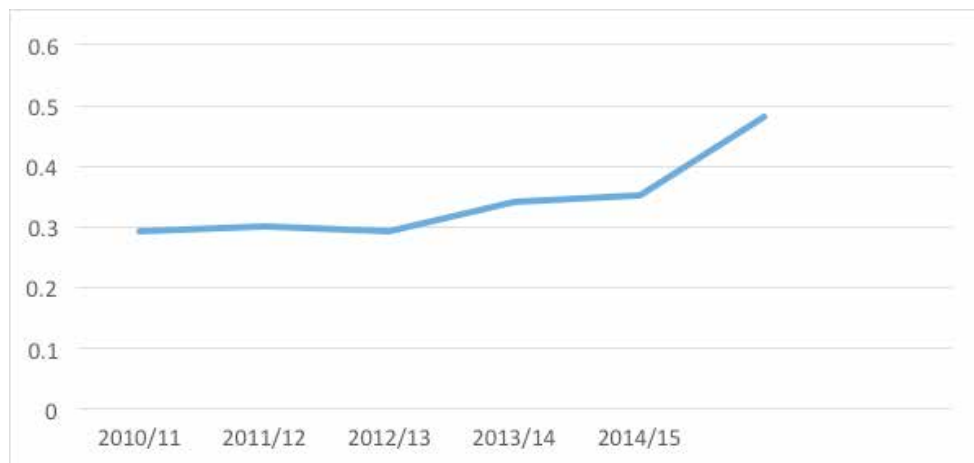
We attempted to correlate the rise in 1 to 5 networks and the number of WDGs, nationally, as indicators of the expansion of the HDA, with the national level proportion of skilled birth attended deliveries, the proportion of pregnant women undergoing at least one antenatal examination, the proportion of recently delivered women undergoing postnatal examination, the contraceptive acceptance rate, the proportion of children less than five

years of age that were fully immunised, as well as with estimated maternal mortality rates and under five, infant and neonatal mortality rates. None of these correlations was significant at the 0.5 level. This could be because the number of data points for the HDA indicators was too few – data were only available for four years – and by the time data were reported the major part of the increase in the 1 to 5 networks and the number of WDGs had already occurred. In addition, several other metrics were increasing at the same time and would qualify as potential confounders of any association of HDA expansion with improved health outcomes and impacts (Figures 7 and 8).

Figure 7. Numbers of health posts and health centres in operation each year from 2009/10 to 2014/15



Source: FMOH Annual Performance Reports

Figure 8. Outpatient attendances per year, per person in Ethiopia, 2009/10 to 2014/15.

Source: FMOH Annual Performance Reports

7.4 Sub-national quantitative assessments of the impact of the HDA

A detailed, cross-sectional community survey in six randomly selected woredas/districts in Tigray identified all 51 pregnancy-related deaths that occurred between May 2012 and April 2013,³³ and gave a maternal mortality rate of 266 deaths per 100,000 live births – rather less than the national estimated rate of 420 per 100,000 live births during the same period. Over 70% of these deaths occurred at home and nearly two-thirds of deaths were directly due to obstetric causes, the most-common by far being haemorrhage (34%). All the major causes of death

³³ Godefay H, Byass P, Kinsman J, Mulugeta A. Understanding maternal mortality from top-down and bottom-up perspectives: case of Tigray Region, Ethiopia. *J Glob Health*, 2015; 5. Doi:10.7189/jogh.05.010404.

were those that could be reduced by skilled care at birth and emergency antenatal care. An unexpected finding was that maternal mortality appeared to be inversely related to population density – the more remote the district, the higher the risk of pregnancy related death. However, in the most remote district at the time of the survey the kebeles did not have HEWs, and reduced access to health care may have been a contributing factor to the deaths in those remote districts. The authors suggested “that logistic constraints probably persist as a major determinant of maternal mortality.”

“Key to the present paper ... is the protection that being a member of the HDA provided against pregnancy-related mortality. This is the clearest demonstration yet of the positive effect that the HDA can have on women’s health.”

A subsequent case-control study³⁴ of maternal deaths in the same woredas looked at individual as opposed to community risk factors, by using controls from the same areas. It identified four independent risk factors that were associated with maternal death: not being a member of the HDA; having a husband or partner who was uninvolved in the pregnancy; a previous history of another illness; and never having used contraception. Previous studies had shown that women’s access to health services is often determined by their

husbands, which can inhibit women’s utilization of available services, and there is an expectation that the husband will be available for decisions and financial support should complications arise³⁵. A husband who fails to meet those expectations could lead to serious negative consequences on his wife’s pregnancy outcome³⁶. Approaches that promote male involvement in reproductive health service utilisation are clearly needed. The finding that previous illnesses impact negatively on the outcomes of pregnancy is a clear call to ensure that other disease control services are linked with maternal services to address the common causes of

34 Godefay H, Byass P, Graham W, Kinsman J, Mulugeta A. Risk factors for maternal mortality in rural Tigray, Northern Ethiopia: a case control study. *PLoS One*, 10(12): e0144975. Doi:10.1371/journal.pone.0144975

35 Mekonnen Y and Mekonnen A. Factors influencing the use of maternal health care services in Ethiopia. *Journal of Health, Population and Nutrition*, 2003; 21:374-382.

36 Bedford J, Gandhi M, Admassu M, Girma A. “A normal delivery takes place at home”: a qualitative study of the location of childbirth in rural Ethiopia. *Matern Child Health J*, 2013; 17: 230-239. Doi: 10.1007/s10995-012-0965-3. PMID: 22359241

co-morbidities, namely anaemia, tuberculosis, malaria and HIV/AIDS. The relationship between the use of contraception and pregnancy outcome is likely to indicate that women who used contraceptives were more aware of reproductive health issues and perhaps more willing and able to exert control over their own well-being. Family planning is also thought to contribute to maternal survival through increased birth spacing.

Key to the present paper, however, is the protection that being a member of the HDA provided against pregnancy-related mortality. This is the clearest demonstration yet of the positive effect that the HDA can have on women's health.

A further study by the same group using the same maternal death data, showed that in those districts with above average utilisation of the new ambulance service, maternal deaths were reduced to less than half those in districts with below average utilisation³⁷. Distance to a health facility, mobile network availability and ambulance utilisation were all significantly associated with pregnancy-related mortality on a bi-variable basis. On a multivariable analysis however, "ambulance non-utilisation uniquely persisted as a significant determinant of mortality". This illustrates the overlapping nature of very different types of health input which, although different, can still contribute to the same effect, namely a reduction in maternal mortality. It also emphasizes that more than one input may be required to achieve the desired outcome – in this case membership of the WDG, and the availability of free ambulances.

A recent study³⁸ in the agrarian regions and Addis Ababa showed that successful woreda level HEP work was more likely when data was used to solve problems, when there were respectful and supportive relationships with the community, when there was strong support from zonal and regional health bureaus. The authors

37 Hagos Godefay, John Kinsman, Kesetebirhan Admasu, Peter Byass. Can innovative ambulance transport avert pregnancy-related deaths? One-year operational assessment in Ethiopia. *Journal of Global Health*, 2016 Vol. 6 No. 1, 1-9. doi: 10.7189/jogh.06.010410

38 Fetene N, Linnander E, Fekadu B, et al. The Ethiopian Health Extension Program and variation in health systems performance: what matters? 2016, *PLoS One*; 11(5): e0156438. Doi:10.1371/journal.pone.0156438

suggest that management and organization and governance capacity are just as important as the technical inputs to an HEP programme. They also found that motivation of staff was a challenge whether the programme they worked in was successful or not, and that motivation depended on financial compensation, possibilities for career progression and supervision that was supportive. The study did not address whether correction of these factors raised performance levels, but it does indicate where future improvements for the HEP/HDA may be generated.

7.5 Funding

Expansion of the HDA was made possible primarily by allocations from central and regional government. Between 2009/10 and 2015/16, government health expenditure increased over 5-fold from ETB 4.7 billion to ETB 25.3 billion, as the Ethiopian economy improved and total government expenditure rose³⁹. This represented annual increases in nominal expenditures (taking no account of inflation) between 20% and nearly 40%. As a proportion of total government expenditure, public health expenditure rose from 6% to 8%.

The FMOH annual reports do not provide the resolution to enable working out the amounts of money allocated to the HDA. These activities are spread over several of the budget areas such as health service strengthening, health service delivery, maternal care, etc. Therefore calculations of national and regional expenditures on specific HDA expenditures over time are beyond the scope of this document. Capital costs would, however, be relatively low, since infrastructure created through the HDA, such as maternal waiting rooms, were usually in rural areas, provided by community labour. Material costs were often shared by the community and kebele administration. The bulk of the costs would be HEW and health centre staff time, with some allocation of time spent by administrative and technical staff at kebele, woreda, zonal and regional levels.

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Ministry of Finance and Economic Development. Summary of General Government Finance, Performance 2009/10-2015/16.

Funds were also provided for health systems strengthening, including infrastructure expansion, notably construction of health centres and procurement of equipment, by both the Global Fund to Fight against AIDS, Tuberculosis and Malaria, and by GAVI, the vaccine alliance. The World Bank, the UK's Department for International Development, the Royal Netherlands Embassy, Irish Aid, the Canadian International Development Agency and the Italian Cooperation have all contributed to the HEP, and by extension, to the HDA, through the Basic Services Protection Programme to supply medical equipment for health centres and health posts, essential drugs and contraceptives, as well as insecticide treated bed nets. UNICEF and UNFPA provided support in the bulk procurement and distribution of health commodities to service delivery points.

8. FUTURE NEEDS AND PLANS

Communities are increasingly demanding a range of health services which are not currently provided at the health post level. This includes the capacity to treat and manage a greater range of conditions, and will likely require HEWs to play their part in addressing the shift of the disease burden from communicable to non-communicable diseases that is already happening in Ethiopia, as in other African countries. To satisfy the community's needs, upgrading the knowledge, competency and capacity of the HEWs will be necessary. The vision is to move towards a system where, in the future, the HEWs will become general medical practitioners. This move fits well with the need to increase the motivation of the HEWs, many of whom have been in post for over ten years with no promotion and little salary increase.

Starting from level 3 a clear career path was established for HEWs. Volunteer WDG members, with literacy or some type of adult education, start at level 1 with training on the HEP which they share with other women among their peers, and which they use to monitor household performance. There are currently pilot programmes in Tigray and Oromiya where WDG members can move to level 2, by attaining the equivalent of a primary level education, in addition to proficiency in their work.

To be hired by the Government at the entry-level (level 3) in rural settings, prospective HEWs who have completed 10th grade of high school are enrolled in technical and vocational schools and regional health science colleges to master the components of the HEP, based on the occupational standards prepared by the Government. To retain talent after many years of service, particularly of HEWs with good performance records and leadership qualities, on the job training has started on the science behind the practices for those who wish to reach Level 4, and the option of careers in curative health, management etc. Once HEWs (and skilled Traditional Birth Attendants) pass a level 4 competency test, they can be enrolled in regional science colleges for a period ranging from one to one and a half years for clinically focused training.

Most of the current 38,000 HEWs are expected to attain Level 4 level by 2020. To replace the lower echelons, 5,000 new HEWs are to be hired each year with the aim of having enough HEWs in place to counter the expected attrition of HEWs moving into other functions/employments, maternity leave, etc.

For urban HEWs, the practice in the past had been to recruit nurses with diplomas and train them for three months on public health before they start work. However, the high level of turnover in urban settings compared to rural settings has prompted a re-think. The current plan is to recruit at the high school level, similarly to rural HEWs, and then train the urban prospective HEWs for level 3 and level 4 consecutively. The first batch of 88 prospective urban HEWs recruited under this model are currently training at Menelik II Hospital in Addis Ababa.

9. DISCUSSION

9.1 Impact of the HDA

The HDA is one of the most ambitious health oriented community mobilization programmes in the world, building on the foundations of the HEP. The HEP has rightly been classified a success. Even though the HEP and the HDA are so closely intertwined, the question should be asked of the HDA, "What does it add to the

services provided by the HEP?" The HDA includes significant additional efforts (additional to those of the HEP) to mobilise communities to support pregnant women and in particular to encourage them to give birth in health facilities where skilled birth attendants are available. It also aims to engage all women to spread knowledge to every single household about better hygiene, improved nutrition, prevention and management of common childhood conditions and HIV, malaria and tuberculosis, family planning and preparedness for delivery. Every household is then urged, and supported, to implement actions based on this knowledge. Their performance is monitored and feedback given. The HDA also provides community support networks for women, helping them not only in health matters, but supporting them in their agricultural activities, and providing social, and sometimes economic assistance. The HDA also contributes to referral linkages within primary health care units.

It seems plausible, therefore, that the national increase in the proportion of women delivering in health centres and hospitals from 17% in 2009/10 to 61% in 2014/15 is due to the efforts of the HDA, even though the rise in 1 to 5 networks and the number of WDGs, nationally, does not correlate statistically with the national level proportion of skilled birth attended deliveries. It is also plausible that increases in the proportion of pregnant women undergoing at least one antenatal examination, the proportion of recently delivered women undergoing postnatal examination, the contraceptive acceptance rate, and the proportion of children less than 5 years of age that were fully immunised, were also, at least in part, due to the HDA.

It is also true however that, at the same time as the HDA has been in existence, the FMOH and RHBs have staffed health centres with properly-trained midwives to ensure round the clock availability of basic emergency obstetric and neonatal services, and provided a 24 hour a day ambulance service, free at the point of need in most woredas. They have also ensured availability of motorised ambulances. At the same time, other agencies have expanded the road system and the mobile phone network and the level of ownership of mobile phones has increased. All of these inputs greatly facilitate the task of referring a woman in labour to the health centre (or if complications occur, to the nearest hospital), and of providing appropriate care, and has probably stimulated increased demand for health services.

Similarly, it seems likely, but cannot yet be proven, that the HDA has also played a part in the recent improvements in estimated maternal mortality rates and under five, infant and neonatal mortality rates. The major reason for being unable to prove an association is probably the limited amount of regional and national data charting the expansion of HDA efforts. There are too few annual data points, with insufficient data captured in the first year of operations, and too many inconsistencies in the data. Furthermore, attempts to restrict the numbers of 1 to 5 networks and WDGs to those that are actually functioning means that definitions of collected data have changed in different regions, at different times, with unexpected variations in the reported numbers of 1 to 5 networks and WDGs.

9.2 Drivers of success of the HDA

Government leadership and political commitment have clearly been key, supported by significant annual increases in health expenditures. Strong analytical and policy preparation capacity has been a critical success factor. The national Health Sector Development Plan has successfully translated health policy into action. The FMOH has consistently held up the HDA as the flagship programme of the health sector, as illustrated by the Annual Performance Reviews of the last five years. The relationship between the FMOH and the Regional Health Bureaus has been central to sharing out the costs of the HDA between central and regional government, whereby salaries of the HEWs and the basic running costs of both the HEP and HDA are funded locally (at regions, zones and woredas), creating a foundation for local ownership and sustainability.

Woreda administrations have upgraded health centres, increased staffing levels and the level of training of staff, and implemented mentoring systems for the HEWs. Kebele administrations have done the heavy lifting of appointing suitable HEWs, constructing health posts and supporting the WDGs and the HEWs.

The women themselves have taken on the responsibility for improving the health of their own families and communities, and especially in the areas where the WDGs are strong, have done so very effectively. Households have shown themselves capable of adopting behaviours that improve their own health, and have taken

responsibility for passing on knowledge and promoting behaviours that lead to positive health outcomes to other households. They have been able, in other words, to multiply the effects. The HDA has been able to make the key principle of the HEP, namely ensuring ownership of and responsibility for their own health by the local community, a reality.

The HDA has been grafted on to the pre-existing government structure and health administration. Its activities are implemented and supervised by pre-existing staff. It is completely integrated into existing systems, cutting down costs and avoiding time-consuming and expensive debates about roles and responsibilities. Vertically mobilised resources have been used for HDA activities and have strengthened the pre-existing health system, rather than weakening it. Costly parallel systems have been avoided.

Health information systems, continuous assessment and in-service training have been deployed to maintain continuous improvements in quality of programme management and service delivery. Referral systems that extend from households to specialised hospitals have been created by the HEP, and now deliver a comprehensive package of essential services. The HDA has been instrumental in completing the grass-roots component of that referral system.

The HDA is best established in the agrarian regions, and the conclusions of this paper are largely based on the experience there. Its performance in the cities and towns and in the pastoralist regions needs careful analysis.

Some weaknesses remain. Not all regions show the same levels of success. Individual performance is variable, and better performance than average largely goes unrewarded. More attention needs to be paid to the quality of data, which needs to be more systematic and better organised. Clearer instructions are required in the collection of data so that the same information is collected everywhere, and local definitions of, for example a, "functioning WDG", are avoided. Data should be more assiduously checked at all levels, and certainly before being published, and should be signed off by the senior officer responsible once it is finalised. Finally, data should be stored on

properly designed data bases in official computers, with appropriate off-site back-up, protected from viruses and other malware.

The HDA needs continuous follow-up and capacity building until the behaviour changes needed for all these measures are fully instilled into society. Mass training is now being rolled out to encourage model kebeles, as well as model households, to achieve open-defecation free environments, zero home deliveries and better than 85% performance on the 16 elements of the health extension package.

As can be seen from the references in this paper, the HEP has benefitted from a significant expansion of health research in Ethiopia in recent years. A plethora of studies conducted in selected regions, woredas and even kebeles have assessed the performance of elements of the HEP. This work now needs to be extended to analysing the performance of the HDA.

THE HEALTH DEVELOPMENT ARMY: ITS ORIGINS, DEVELOPMENT AND CURRENT STATUS

THE HEALTH DOCUMENTATION INITIATIVE

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