Goals and Objectives

For anesthesia, the goal of the HRH Project – working in partnership with the Ethiopian Federal Ministry of Health – was to scale up production of anesthetists and ensure quality of anesthesia workforce. Specific objectives were to:

- Increase the number of students graduating from anesthesia training programs,
- Improve the quality of anesthesia education, and
- Build local capacity for continuing professional development, licensure, and regulation.

Need for Action

A shortage of qualified anesthesia professionals has restricted access to emergency and essential surgical services in Ethiopia. In 2012 there were only 252 anesthetists and less than 20 anesthesiologists providing anesthesia service nationally (i.e. one anesthesia provider for every 330,000 people which is far below the global benchmark of 5 providers to 100,000 population). A variety of factors have contributed to the shortage, including the: limited capacity of pre-service training programs and associated clinical practice sites; difficulty attracting top students to the anesthesia training track and consequent high dropout rates, especially among female students; and inequitable distribution and high turnover among practicing anesthetists. Weaknesses in the quality of anesthesia education and the absence of regulation also have compromised the quality of services offered by practicing anesthetists.

To build the size and capacity of the anesthesia workforce and provide Ethiopians with equal access to quality safe surgical and anesthesia care, the Government of Ethiopia sought technical and financial support from the USAID-funded Jhpiego-led Strengthening Human Resources for Health (HRH) Project (2012-2018). The goal of the HRH Project is to improve infectious disease and maternal and newborn mortality outcomes by improving human resources for health management, increasing the availability of midwives, anesthetists, health extension workers (HEWs), and other essential health workers, improving the quality of training of health workers, and generating evidence to inform HRH policies, programs and best practices.

Key Successes

- Expanding the number and type of anesthesia training programs at public universities and colleges, as well as the quality of education they offer, has contributed to a steady increase in the number of students enrolling (from 157 in 2012 to 715 in 2018) and graduating (from 98 in 2012 to 344 in 2018).
- The proportion of women enrolled in anesthesia programs has grown from 9% in 2013 to 34% in 2018.
- The Ethiopian Association of Anesthetists (EAA) has increased its capacity to play a central and visible role in improving quality of anesthesia education, continuing professional development and regulation.
Strategies and Interventions

Building the capacity of the EAA (Ethiopian Association of Anesthetists). A large majority of anesthesia providers (accounting more than 92%) in Ethiopia are anesthetists, so the HRH Project worked to strengthen the professional organization representing them—the EAA. This included restructuring the organization; building leadership, strategic planning, and management capabilities; developing policy and procedural handbooks; furnishing and equipping central and regional offices; and facilitating internal and external communications. EAA increased its staff to 29 and its membership to 2,150, and the organization became a full partner in national human resource development in anesthesia.

Expanding the number of anesthesia training slots. Three strategies were used to add more training slots in anesthesia. First, targeted technical, financial, and material support from the Federal Ministry of Health (FMOH) and the HRH Project enabled the three existing anesthesia programs to expand the number of new students enrolled each year from 157 in 2012 to 715 in 2018. Second, the deans of 22 universities and Regional Health Science Colleges (RHSCs) were persuaded to establish new anesthesia training programs with places for 500 students to enter each year. Third, an alternative training track (post-basic BSc) was developed for diploma-level nurses with two years of experience; this enrolled 100 students annually.

Improving student selection, motivation, and retention. To attract highly capable students, a nationwide campaign promoted careers in anesthesia through social media, on television and the radio, and at local high schools. Promotional activities targeting women, together with gender-based supports like affirmative action in admissions, were used to recruit more female students to anesthesia program. To reduce targeted or preferential admissions, female students were offered life skill training, counseling, and financial and material support. To motivate and retain anesthesia students, the EAA organized and mentored a student association, invited student representatives to its annual conferences, and awarded medals and certificates to top students.

Revising curricula and assessment methods. The EAA and the HRH Project developed competency-based national curricula for Level V, BSc, and MSc anesthesia programs, informed by a task analysis study to ensure that training was aligned with practice realities. Accompanying clinical practice syllabi incorporated innovative learning and assessment methods. With the aim of establishing a valid and reliable assessment system, assessment blueprints for 21 anesthesia courses were developed, and Objective Structured Clinical Examination (OSCE) testing was introduced for training and evaluation purposes.

Strengthening faculty knowledge and skills. The EAA and the HRH Project developed and delivered a series of needs-based in-service training packages for anesthesia instructors and preceptors; some focused on improving teaching skills, others on technical expertise. More than 400 anesthesia instructors and 475 preceptors attended these trainings. To expand the pool of qualified anesthesia instructors, the HRH Project supported the revision and expansion of the MSc program in anesthesia, raised national awareness of professional volunteerism, and honored anesthetists who served as committed teachers with awards from the EAA.

Developing practice standards, guidelines, and protocols for good quality care. With the support of the HRH Project, the EAA developed scopes of practice and standards for anesthetists with different levels of education based on the World Health Organization recommendations. In addition, over 20 clinical management algorithms and protocols were developed, printed, laminated, and distributed to more than 100 hospitals. These tools have been used to provide good clinical care while also serving as a standardized learning tool for anesthesia education.
Building infrastructure. The HRH Project equipped skills development labs with 513 simulators, stocked medical libraries with 1174 anesthesia textbooks and 8260 supplemental reference books, strengthened clinical practice sites with 13 Universal Anesthesia Machines together with integrated patient monitors, supported the development and printing of 2405 Level V anesthesia training modules (13 types), and distributed electronic teaching materials, such as 12 laptops, 405 computers and 24 LCD projectors. Resource sharing between RHSCs and nearby universities has also been encouraged.

Reducing overcrowding at clinical practice sites. With the support of the HRH Project, anesthesia training institutions developed selection criteria to identify additional clinical practice sites and signed Memoranda of Understandings (MoU) with them. To improve utilization of these sites, the Project encouraged anesthesia programs to assign clinical practice coordinators and established a mechanism to review collaboration with clinical education sites. It also donated 13 vehicles to transport students to the sites.

Strengthening regulation. The HRH Project supported the development of National Accreditation and Quality Improvement Standards for Anesthesia Education in 2013. Anesthesia training institutions have used the standards as a tool for self-evaluation and quality improvement, while the authorities have used them for audit and accreditation of health education institutions.

Assuring the competence of practicing anesthetists. The EAA worked with the FMOH to develop a national licensing examination and a code of ethics and conduct for anesthetists. The EAA created a series of nine CPD (continuing professional development) training packages, based on the results of a task analysis, to ensure that anesthetists possess and retain the capacity to practice safely and effectively within an evolving scope of practice. In addition, the EAA promoted research by members and health education institutions and sponsored an annual scientific conference to update members.

Results and Lessons Learned

Increasing the number, size, and variety of public-sector training programs eliminated a bottleneck in the production of anesthetists and has increased access to anesthesia services. The number of students enrolling in and graduating from anesthesia programs in Ethiopia has climbed sharply (see Figure 1). As a result, the number of practicing anesthesia professionals has grown by more than 1,000, making their services more widely available. However, progress has been slow because:

- Newly opened anesthesia training programs are operating below capacity due to lack of infrastructure and faculty.
- Most Level 5 anesthesia nursing programs have closed due to a dearth of applicants and, in some regions, the lack of financial incentives for this type of training.
- The government and HRH Project did not involve the private sector in clinical training, either via public-private partnerships or the establishment of private programs.

A combination of interventions improved the quality of anesthesia education and, ultimately, the competence of graduate anesthetists. Anesthesia education benefited from mutually reinforcing interventions directed at student selection, learning and assessment methods, faculty capacity, infrastructure, and clinical and accreditation standards. The impact of these interventions was heightened by faculty involvement in their design and implementation along with inputs and leadership from the EAA. A sense of positive competition among the training institutions provided an additional source of motivation. The ultimate outcome was a statistically significant increase in the competence of students graduating from anesthesia programs: average OSCE scores rose from 61.5% in 2013 to 65.7% in 2016,
while mean scores on the national licensing examination rose from 60.4% in 2015 to 65.0% in 2016. However, not everything went as planned. For example, some materials – such as skills development lab equipment – were not used effectively due to specification and distribution problems, while internal quality improvement audits of training programs were conducted irregularly.

**Gender-based interventions to recruit and support female students have been successful.** Female enrollment in anesthesia training programs has increased steadily, rising from 9% of all students in 2013 to 34% in 2018, partly due to the efforts of Gender Offices at each health education institution, which support female students to stay and perform well in their study. These activities have contributed to an improvement in the performance of female anesthesia students; average OSCE scores for female graduates increased from 56.9% in 2013 to 66.3% in 2016.

**Networking among anesthesia training departments has created a sense of ownership in HRH interventions and helped achieve project targets.** All 25 anesthesia departments built strong bonds with one another through face-to-face meetings, a shared email pool, and the efforts of a committed and trusted professional association (the EAA). The network played an active role in crafting the agenda to increase the availability of qualified anesthetists, including agreements on the opening of new schools and enrollment numbers. Departments also share the results of program quality audits and improvement efforts.

### Key Takeaways

- The focus on strengthening clinical education for anesthetists is critical. Efforts to institutionalize the use of newly developed clinical management protocols and algorithms, expand clinical practice sites, and strengthen skills development labs should continue to be a priority moving forward.
- Joint planning and collaborative implementation between the FMOH, universities and colleges, and the HRH Project enhanced the acceptability, ownership, and ultimate success of interventions. As more stakeholders become involved, emphasis should be placed on proactive joint planning and ongoing dialogue to avoid duplication of effort and ensure that interventions are need-based and sustainable.

### Next Steps

1. **Continue the investment to increase the quantity and quality of anesthetists:** The 5-year Human Resource plan for FMOH projected that 2680 and 4678 anesthetists are required by the year 2020 and 2025 respectively. Though promising changes have been brought with the HRH Project support, there is yet an increasing demand in investment to increase the quantity and quality of anesthetists to the government required level.

2. **Align anesthesia-related plans with the government roadmap:** The FMOH has developed a 5-year anesthesia roadmap (2017-2022) that indicates future directions for the profession’s education and practice. Aligning future plans with the roadmap will help meet government expectations and facilitate implementation of planned activities.

3. **Periodically review and revise anesthesia curricula:** Curricula must change to reflect new science and shifting community demand. Task analysis studies can produce the tangible evidence needed to inform curricular change.

4. **Target future support to the newest and neediest anesthesia training programs:** University programs generally have greater human and physical resources than RHSCs, and older programs have more resources than newer programs. Certain programs also have benefitted from donor interest. To raise all programs to an equal level, future support should be directed to the neediest programs.

5. **Promote resource sharing between anesthesia training sites:** Resource sharing among nearby training sites – facilitated by the EAA – can maximize the use of limited resources and equalize the education offered at different training sites.

6. **Avoid the duplication of efforts by development partners:** Because safe surgery and anesthesia is a priority for the FMOH, multiple development partners are likely to collaborate on future interventions. Proactive discussions among partners and responsible directorates inside the FMOH can ensure that their efforts complement one another and create synergies.

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For more information: Kirkos Subcity, Woreda 02/03 | House No. 693 | Wollo Sefer/Ethio-China Street, near Mina Building | P.O. Box 2881 | Code 1250

Addis Ababa, Ethiopia | Tel: +251(0)115-502-124 | Fax:+251(0)115-508-814 | https://www.jhpiego.org/what-we-do/human-resources-health/

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This program learning brief is prepared by Ethiopian Association of Anesthetists and Yohannes Molla and reviewed by Dr. Tegbar Yigzaw, Dr. Sharon Kibwana, and Adrian Kols.

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