

How we can help pathologists in Ethiopia

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February 2024—Ethiopia's health care system is at a crossroads as it grapples with the dual burden of infectious diseases and a surge in noncommunicable ailments.

The country's health care infrastructure is organized hierarchically into primary, secondary, and tertiary levels, each with distinct roles and coverage areas. In urban locales, primary health centers at the woreda (district) level serve about 40,000 people, offering basic services like vaccinations and maternal care. In contrast, rural health centers cover 15,000 to 25,000 people. They are the bedrock of community health, further divided into health posts, a health development army, and model families at the kebele (a small administrative unit within a woreda) level. (Model families, led by women, implement five health extension packages, such as immunization and family planning, and become models for their communities.) General hospitals at the secondary level offer specialized services like surgery and internal medicine to regional populations of 1 to 1.5 million. At the apex are specialized hospitals that provide tertiary care in disciplines like cardiology, neurology, and oncology, covering 3.5 to 5 million people.

While the system attempts to be comprehensive, it faces significant challenges, among them resource constraints and accessibility problems, particularly in remote rural areas. As of 2021, Ethiopia had about 141 health centers, 87 general hospitals, and about 10,000 beds. However, the doctor-to-patient ratio stands at 1:10,000, far below the World Health Organization's recommended 1:1,000.

Amid these challenges, Ethiopia is witnessing a seismic shift in its health care. Historically geared toward combating infectious diseases like malaria and tuberculosis, the system is now contending with a rise in noncommunicable diseases such as hypertension, diabetes, and various forms of cancer. The Ethiopian government, recognizing these evolving needs, is investing in health care infrastructure and training. International nonprofit organizations such as People-to-People are also stepping in to bolster the system.

Pathology and laboratory medicine. In Ethiopia, the health care system has seen significant advancements, particularly in pathology and laboratory medicine. The pathology specialty in Ethiopia was first established in 1965 at Tikur Anbessa Hospital, where the country's first pathology residency program began in 1981 and from which 108 pathologists have since graduated. Other institutions like the University of Gondar, Jimma University, Hawassa University, Mekelle University, and Saint Paul's Hospital Millennium Medical College followed suit, each contributing to the number of pathologists and biopsies performed annually. There are now six residency programs that enroll 22 to 27 residents each year, and 183 pathologists have graduated from these programs (**Table 1**).

The pathology service includes fine-needle aspirate and body fluid cytology, gynecologic cytology (not provided as routine screening but for selected patients), hematopathology, and surgical pathology. All services are equipped only with routine stains without ancillary techniques, such as immunohistochemical stains, in situ hybridization, and flow cytometry, to support morphologic diagnosis. In addition to the hospitals with affiliated residency schools or programs, government hospitals in major cities and towns provide cytology service, though it is not always continuous.



Dong Chen (third from left), of Mayo Clinic, visits with pathologists at Saint Paul's Hospital: Mesfin Assefa (from left), Amanuel Yeneneh, Hawi Debebe, Hiwot Mehari, Selemon Mulualem, Kassaye Demoz, and (seated) Selamawit Tadesse Wendimagegn.

In Ethiopia, the field of pathology is experiencing a dynamic shift, with a growing role for private laboratories alongside traditional government setups. Currently, the country has about 110 pathologists, which translates to a staggering ratio of one pathologist for every million people. The majority of these professionals are employed in government institutions, but many also work part time in private setups, signaling the emergence of private stakeholders in pathology services. In Addis Ababa, the capital, two private laboratories offer a range of immunohistochemistry panels in-house, while another sends samples abroad for testing. Beyond the capital, regional state capitals also feature private pathology laboratories that provide essential services like cytology, surgical biopsy, and hematopathology. These regional labs often collaborate with their counterparts in Addis Ababa for more specialized tests such as immunohistochemistry. Additionally, major cities outside the provincial capitals, such as Gondar and Dessie, are also home to private laboratories equipped with pathology services. This growing network of private labs is gradually filling the gaps in Ethiopia's health care system.

Institution	Department establishment	Residency	Graduated	Enrolling residents/year	Biopsies/year
Tikur Anbessa Hospital	1965	1981	108	5–7	9,000
University of Gondar	1981	2020		3–4	2,500
Jimma University	1998	2013	22	3–5	3,000
Hawassa University	2006	2015	18	3–5	1,500
Mekelle University	2010	2015	10	3	3,000
Saint Paul's Hospital Millennium Medical College	2014	2016	25	5–6	8,000

Table 1. Pathology residency programs in Ethiopia

The Ethiopian Society of Pathology was established in 2017 to facilitate specialty growth and collaboration. Its formation came after a prolonged effort to meet the country's stringent criteria for establishing a representative national professional association. Since its inception, the society has collaborated with the Ethiopia Ministry of Health to develop standard guidelines that govern private pathology setups. It also serves as an intellectual hub, organizing an annual scientific conference where its general assembly convenes to discuss advancements,

challenges, and future directions. The society aims to promote pathology practice, education, and research in Ethiopia through conferences, workshops, and educational programs. It has ambitious plans to collaborate with regional and international professional associations to further bolster the service and academic aspects of pathology.

Laboratory medicine in Ethiopia serves as a critical pillar in the health care system and has gradually migrated from infectious disease testing to basic noncommunicable disease assessments. The country has made progress in recent years, but there are notable limitations, particularly in the realm of oncology and advanced testing. Resource constraints make many sophisticated diagnostic tests that are commonly available in developed countries scarce or entirely unavailable. This lack of advanced testing capability is an Ethiopian problem and a broader challenge across Africa. For instance, specialized oncological tests, molecular diagnostics, and advanced genetic testing are often not accessible, leading to late-stage diagnoses and limited treatment options for conditions like cancer. Despite the challenges, Ethiopia continues to invest in its laboratory infrastructure, though the gap in advanced diagnostic capabilities remains a pressing concern that underscores the need for further investment and international collaboration.

Challenges. At a recent People-to-People conference in Ethiopia, Dr. Lia Tadesse, Ethiopia's minister of health, discussed the challenges and said, "Most of the poor quality of health care the country faces would not be ameliorated without strong and sustained laboratory and pathology services, and hence we are eager to work tirelessly to achieve this goal."

Ethiopia's medical administration, medical centers, and hospitals are committed to improving pathology and laboratory medicine practice. They face the following challenges:

- **Limited number of pathologists.** Ethiopia faces a severe shortage, with only about 110 professionals serving a population of more than 120 million, which equates to one pathologist for every million people and is far below the global average.
- **Quality management inconsistencies.** Ethiopian laboratories often struggle to maintain a consistent quality management system. Issues range from specimen quality to staining techniques. A study indicated that the quality of sputum smear tests, crucial for diagnosing conditions like tuberculosis, varied greatly, with rates of satisfactory performance ranging from 61 percent to 75 percent.
- **Geographical disparities.** Most pathology labs are concentrated in urban areas, serving only about 20 percent of the Ethiopian population. This leaves most of the people in rural areas without access to essential diagnostic services.
- **Lack of advanced testing.** Many advanced diagnostic tests, particularly in oncology, are unavailable because resources are limited.
- **Inadequate infrastructure.** With only a handful of pathology laboratories in the country, the existing infrastructure is inadequate to meet the health care needs of the Ethiopian population.
- **Lack of referral networks.** Ethiopia lacks a well-defined specimen referral

network, making it difficult for samples to be sent to specialized labs for advanced testing. This is particularly problematic for patients in rural areas who have to travel long distances for basic diagnostic services.

- Needed growth in public-private partnerships. The health care system is in dire need of investment from the public and private sectors. A well-defined public-private partnership could improve the reach and quality of pathology and laboratory medicine services. A government policy or initiative may be required to promote this growth.

How the CAP and other medical organizations can help. The aforementioned gaps and limitations underscore the urgent need to grow and build pathology and laboratory medicine in Ethiopia.

The CAP and other international medical organizations can help with the myriad challenges, one of the most pressing of which is the country's acute shortage of qualified pathologists. Pathology residency programs in the U.S. can partner with Ethiopian medical schools to help develop robust pathology residency programs. This could be supplemented with scholarships or fellowships for Ethiopian medical students to receive specialized training abroad. The CAP could create a platform for exchanging knowledge and best practices among local and international experts by organizing workshops, seminars, and conferences in Ethiopia. These events could also serve as networking opportunities, opening doors for further collaboration and research.

Quality assurance is another critical area where the CAP's proficiency testing and accreditation programs could have an impact. By adapting these programs to the Ethiopian health care system, the CAP could help standardize laboratory procedures. These programs could also serve as a model for other African countries facing similar challenges.

Technology transfer is also crucial. Given the scarcity of advanced diagnostic tests, particularly in oncology, vendors and laboratories could facilitate the donation or discounted purchase of state-of-the-art laboratory equipment. Moreover, they could provide training programs for Ethiopian laboratory technicians on how to use this equipment effectively, ensuring that the technology transfer is sustainable in the long term.

Public-private partnerships are an underexplored avenue. The CAP or other medical organizations, such as People-to-People, could mediate between the Ethiopian government and private investors, encouraging the latter to invest in the health care sector. This could lead to the establishment of more pathology labs and diagnostic centers.

The CAP could collaborate with Ethiopian institutions on various research projects, from epidemiological studies to clinical trials. Such collaborative research could contribute to the global body of medical knowledge and lead to localized solutions specific to Ethiopia.

In summary, organizations like the CAP can potentially bring about transformative changes in Ethiopia's pathology and laboratory medicine sector through a multipronged approach that includes capacity building, quality assurance, technology transfer, public-private partnerships, education, and research.

Winston Churchill said, "We make a living by what we get, but we make a life by what we give." Pathologists in Ethiopia have been giving tirelessly, often with limited resources, to ensure that patients receive the best care possible. Their dedication to the well-being of their fellow citizens is a testament to the transformative power of altruism in health care. Organizations and medical professionals worldwide have an opportunity to contribute to this noble cause. By extending our expertise and resources, we can help Ethiopian pathologists achieve their mission. Let this be our collective calling, for in lending a helping hand, we not only enrich others' lives but also fulfill the highest expression of our humanity and profession.□

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