

# Mixed-methods assessment of surgical capacity in two regions in Ethiopia

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**Background:** Surgery is among the most neglected parts of healthcare systems in low- and middle-income countries. Ethiopia has launched a national strategic plan to address challenges in the surgical system. This study aimed to assess surgical capacity in two Ethiopian regions to inform priority areas for improvement.

**Methods:** A mixed-methods study was conducted using two tools adapted from the Lancet Commission's Surgical Assessment Tools: a quantitative Hospital Assessment Tool and a qualitative semistructured interview tool. Fifteen hospitals selected by the Federal Ministry of Health were surveyed in the Tigray and Amhara regions to assess the surgical system across five domains: service delivery, infrastructure, workforce, information management and financing.

**Results:** Service delivery was low across hospitals with a mean(s.d.) of 5(6) surgical cases per week and a narrow range of procedures performed. Hospitals reported varying availability of basic infrastructure, including constant availability of electricity (9 of 15) and running water (5 of 15). Unavailable or broken diagnostic equipment was also common. The majority of surgical and anaesthesia services were provided by non-physician clinicians, with little continuing education available. All hospitals tracked patient-level data regularly and eight of 15 hospitals reported surgical volume data during the assessment, but research activities were limited. Hospital financing specified for surgery was rare and the majority of patients must pay out of pocket for care.

**Conclusion:** Results from this study will inform programmes to simultaneously improve each of the health system domains in Ethiopia; this is required if better access to and quality of surgery, anaesthesia and obstetric services are to be achieved.

\*The Safe Surgery 2020 Collaborators are co-authors of this study and can be found under the heading Collaborators. Initial analysis presented to the American College of Surgeons Clinical Congress, Washington DC, USA, October 2016

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## Introduction

An estimated five billion people, residing in primarily low- and middle-income countries, cannot access safe, timely and affordable surgical and anaesthesia care<sup>1</sup>. Surgical and anaesthesia care should be included in universal health coverage, meaning that all people should have access to surgery and anaesthesia of high enough quality, that is effective and affordable<sup>2</sup>. To align with this aim, the Federal Ministry of Health of Ethiopia launched its national surgical plan, Saving Lives Through Safe Surgery, in 2015. Saving

Lives Through Safe Surgery is a comprehensive national policy to improve the access to and quality of surgical services within the health system<sup>3</sup>. By means of Saving Lives Through Safe Surgery, Ethiopia became one of the first low-income countries to commit formally to improving surgical and anaesthesia care by making it a national priority.

Although the current literature consistently shows that challenges in the surgical system are common globally, much of it is heterogeneous in methodology and quality<sup>4–8</sup>. Previous capacity assessments in Ethiopia

showed deficits across each of the five domains required for a functioning health system: service delivery, infrastructure, workforce, information management and finance.

Challenges affect the delivery of surgical services in Ethiopia, which has one of the lowest measured surgical rates worldwide<sup>9</sup>, over 30 times less than the target of 5000 operations per 100 000 population<sup>1</sup>. Capacity has expanded greatly within the three-tiered public health system (*Fig. 1*), with the number of hospital beds per 1000 people increasing 30-fold over 3 years (2008–2011)<sup>10</sup>. However, the surgical workforce has not expanded proportionately. As of 2014, Ethiopia reported 0.5 specialist surgical providers per 100 000 population, in contrast with the set goal of 20 per 100 000 population<sup>1,11</sup>. Furthermore, surgical data collection is not consistent. Until recently there was no national system for the collection of surgical outcomes such as perioperative mortality rate, despite the Lancet target of 80 per cent of countries tracking this indicator by 2020<sup>1,8</sup>. It has also been shown that patients in Ethiopia are often unable to afford surgical care, with an estimated 85 per cent of Ethiopians at risk of catastrophic expenditure for surgical care<sup>7,8,12</sup>.

The aim of this study was to provide a capacity assessment in two regions of Ethiopia. The study also aimed to act as a proof of concept that the Surgical Assessment Tools can be used as a needs assessment to guide evidence-based policy by informing which interventions would be most impactful in improving surgical care. Additionally, the data serve as a baseline against which to measure the impact of the Saving Lives Through Safe Surgery plan and Safe Surgery 2020 interventions.

## Methods

Ethical approval for study activities was obtained from the Institutional Review Board at Boston Children's Hospital and the Ethiopian Public Health Institute.

## Study design

This study used a mixed-methods approach, blending quantitative and qualitative data to provide a comprehensive picture of surgical capacity in selected hospitals in the Tigray and Amhara regions of Ethiopia (*Fig. 2*).

## Study context

In 2016, the General Electric (GE) Foundation launched the Safe Surgery 2020 initiative with the goal of establishing innovative approaches to improve surgical systems worldwide. By bringing together five partner organizations

(Dalberg Advisors, Jhpiego, Assist International, Harvard Medical School's Program in Global Surgery and Social Change, and the G4 Alliance), Safe Surgery 2020 seeks to use leadership development, innovation and research to reduce morbidity and mortality attributable to surgical conditions<sup>3</sup>. Given the strong political commitment and mobilization around surgery, Ethiopia was selected as the first country for Safe Surgery 2020 interventions. The interventions were designed to operationalize the key priorities of Ethiopia's national surgical plan.

## Study sample

Two regions, Tigray and Amhara, were selected for capacity assessment and subsequent intervention by the Federal Ministry of Health. Regions were selected based on Ministry choice and enthusiasm shown by Regional Health Bureaus; anticipated ease of collaboration and political stability factored into this decision. The Regional Health Bureaus and local partners from Jhpiego selected a total sample of 15 facilities, ten hospitals in Amhara region and five in Tigray region, for initial assessment (*Fig. 2*). The selection was based on whether the hospitals were expected to be providing basic surgical care and the hospital directors agreed to participate in the study. Surgical teams from each hospital including surgical, obstetrics, anaesthesia and nursing providers, and hospital administration including the chief executive officer or medical director, were invited to participate in both the quantitative and qualitative aspects of the study.

## Study tool development

Study tools were adapted from the Lancet Commission's Surgical Assessment Tools, which consist of a qualitative and a quantitative component<sup>15,16</sup>. These tools were developed through a systematic review of existing surgical capacity assessments, and were validated by Delphi consensus with a group of surgeons, anaesthesiologists and obstetricians with experience working in low- and middle-income countries<sup>17</sup>. The five-page, 178-question Hospital Assessment Tool addresses five domains of surgical system development: service delivery, infrastructure, workforce, information management and financing. The tool also includes semistructured interview protocols tailored to each provider category of the surgical team (including non-specialists) and hospital administration. These protocols were used to collect qualitative data. A focus group was held with the Surgical Society of Ethiopia to refine and contextualize the tool for Ethiopia. Given the face validity of the tool and multiple previous feasibility

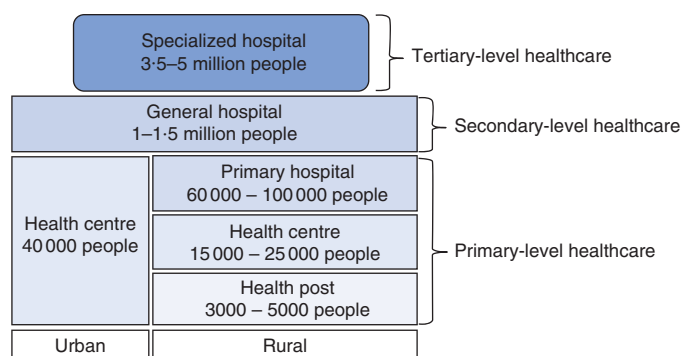


Fig. 1 Ethiopia's three-tier public health system, adapted from the current Health Sector Transformation Plan<sup>13</sup>



Fig. 2 Approximate locations of hospitals in Tigray (population 5.2 million) and Amhara (population 20.6 million) regions of Ethiopia<sup>14</sup>

assessments globally, the Hospital Assessment Tool was used as intended bar minor contextual modifications and no further validation was performed on site before data collection<sup>18</sup>. All study tools can be found in *Appendix S1* (supporting information).

### Data collection

The Hospital Assessment Tool was administered to the hospital administration and surgical teams of the 15 hospitals in Tigray and Amhara, Ethiopia (Fig. 2). The assessment was undertaken by the research team with

the assistance of the Surgical Society of Ethiopia over a 2-week interval in January 2016. All available surgical staff members were invited to participate, resulting in multiple assessments being completed for individual hospitals in the Tigray region. Where multiple answers were provided, the answer from the assessment with the most complete data, or greatest number of fields completed, was reported. Data were not reported if responses from different participants were highly divergent and could not be verified independently by the research team. Following verbal completion of the quantitative tool by the surgical team, the research team undertook a hospital walkthrough with

direct inspection to confirm answers and ensure validity. An item was considered available if the equipment was actually being put to use by the hospital team, and therefore had all the necessary staff, consumables and other conditions to use it (such as reagents and technicians).

Qualitative interviews were conducted with all available and willing surgical team members present at each hospital by the research team with the assistance of the Surgical Society of Ethiopia and Jhpiego. All of those invited agreed to participate in the study. Interviews were conducted in English, but translation to local languages (Amharic or Tigrinya) by fluent collaborators was provided if requested. Question guides specific to each provider category ranged from 30 to 80 questions (number dependent on type of provider) organized into the same five domains: service delivery, infrastructure, workforce, information management and financing. Each interview lasted approximately 1 h and was audio recorded. A total of 37 interviews were completed. Four interviews were found to be incomplete after translation and transcription, and thus excluded from the analysis.

## Data analysis

Quantitative data collected using the Hospital Assessment Tool were analysed in Microsoft Excel® (Microsoft, Redmond, Washington, USA) using descriptive statistics. The availability of surgical equipment, supplies and pharmaceuticals, and selected surgical procedures at all hospitals were assessed using a scoring system. Responses were rated as: 1, 0–25 per cent or never available; 2, 26–75 per cent or sometimes available; or 3, 76–100 per cent or always available. This system matched with previous reporting of surgical capacity assessments<sup>19</sup>.

Thematic analysis was used to code qualitative interviews<sup>20</sup>. Study team members reviewed and discussed responses to each question to assign preliminary codes representing the salient and recurring themes. Although this preliminary set of deductive codes was derived from the interview guide, inductive codes were also allowed to emerge when recognized in analysis of the data themselves. Coding reliability was established by having two independent researchers code each transcript and comparing results for an initial set of transcripts. Any differences in coding were resolved by discussion. Inter-rater reliability was assessed, with a  $\kappa$  score of 0.69 signifying substantial agreement<sup>21</sup>. Transcripts were then analysed using the final coding scheme to identify the salient themes in categories across all interviews. NVivo 11 (QSR International, Melbourne, Victoria, Australia) was used to organize qualitative data and retrieve quotations for reporting.

**Table 1** Facility and respondent characteristics

	Amhara region	Tigray region	Total
Facility level			
General hospital	0	2	2
Primary hospital	10	3	13
Total	10	5	15
Respondents			
Hospital CEO	3	5	8
Surgeon or Integrated Emergency Surgical Officer*	7	2	9
Anaesthetist†	3	4	7
Nurse	5	4	9
Total	18	15	33

\*Integrated Emergency Surgical Officers are Master's level clinical providers in Ethiopia who have received training in emergency obstetrics and general surgery. †As no anaesthesiologists are employed in these regions, anaesthetist refers to nurse anaesthetists or other non-physician anaesthesia providers in Ethiopia. CEO, chief executive officer.

## Results

Characteristics of the facilities and qualitative interview respondents are summarized in *Table 1*. Quantitative data were collected from 26 completed tools in Amhara (10) and Tigray (16). The majority of facilities (13 of 15) included in this study were primary-level hospitals. Qualitative data were drawn from a final analytical sample of 33 semi-structured interviews, 18 from Amhara and 15 from Tigray (*Table 1*).

## Service delivery

### Patient access

In the Hospital Assessment Tool, nine of the 15 hospitals reported that over 50 per cent of patients could reach the hospital within 2 h. Qualitative interviewees reported that access may be limited owing to geography, poor roads and terrain that is difficult to navigate. Most interviewees (14 of 17) reported that patients, particularly labouring mothers and emergency cases, are transported in ambulances typically owned by woredas (city zones) rather than individual hospitals (*Table 2*). Otherwise, patients travel on foot or use bajaj (3-wheeled taxi), private car or public transport to reach care. Referrals out of these hospitals for surgery are common, typically to higher-level facilities with the capacity to provide diagnostic services, specialist care or medical services that are not available at the referring hospital (*Table 2*).

### Surgical procedures

According to the Hospital Assessment Tool, the most common major surgical procedures were caesarean section,

**Table 2** Qualitative interview quotes

Domain	Quote
Service delivery	This hospital doesn't have an ambulance. This was only very recently. However when ambulance was requested, we were told we would not be allowed to use the ambulance because they said it was only for children and delivering mothers. This endangers human lives... We are working on it. Even if we don't have ambulance here, when we have critical patients, we communicate with the available ambulances. As much as possible, we arrange for the individual to cover the fuel for the ambulances and the ambulance can easily transport them instead of the individual looking for a car. It is difficult for us to perform all the services that the general hospital must provide because we are under the structure of a primary hospital. For example, the social work is supposed to be integrated in a general hospital but we don't have the manpower or the resources to do that
Infrastructure	There is a '100 per cent' problem in accessing electricity. We do not have 24-h access and that is a big challenge. It's a problem because high use of the generator at night incurs high costs. We use it the whole day and we turn it off. So patients sleep in the dark... It's a problem if they bleed... That is a big challenge. We have been hoping for some kind of a solution, but so far there is nothing We do not have an autoclave machine, CBC machine, chemistry machine, and no materials for ART. We do not have an ultrasound. These are among the most important items needed to start the service. But we are not going to say that we do not have this or that, and do nothing
Workforce	In regards to retaining the workforce for the physicians, our problem is that there is no senior surgeon or internist. So it is easy to fall into a routine; and there is no one to look up to. There is not that much room to improve ourselves At present, I am working here alone. It is like being a prisoner. I cannot ever stay long at church. I go to the gate and I come back quickly on my bicycle. This is because I cannot be sure of what will happen in my absence. I had notified the hospital about this. They tried to advertise and hire someone. But we could not find anyone
Information management	Our reports go to the region, every quarter. We have not yet done the first quarter report. In the second quarter, we were on PPI, and could not prepare it. On the third quarter, we prepared a general report and submitted it. But we have some gaps in reporting I think the hospital set-up is not towards research and strategy, it is towards service
Financing	We always provided 24 hours free service. The treating doctor and the medical director will sign on the chart and we will provide medications free for the 24 h. Then the hospital will get reimbursed when the attendants bring money later. If they still can't bring money after 24 h, it is going to be very hard on the hospital. If this is the case, we will clearly document that the patient can't pay and keep on treating them with approval of the hospital. There are instances when the hospital staff chip in money to help the patients. The good thing is that such things are very rare We have even raised the [financing] issue in the five to one groups and have decided it to be raised in the management meeting. After talking with the administration, we will ask for budget to treat the free service recipients and emergency patients, who are supposed to receive free service in the first 24 h. We have not started that yet. The physicians are signing and sometimes even paying from their own pockets to treat those kinds of patients

CBC, complete blood count; ART, antiretroviral therapy; PPI, protected personal information.

appendicectomy and laparotomy. Reported availability of additional procedures can be found in *Table S1* (supporting information). Qualitative interviewees reported that not all bellwether procedures (caesarean section, laparotomy and management of open fracture)<sup>1</sup> were performed consistently (*Fig. 3*). The mean(s.d.) surgical volume from eight primary hospital respondents was 5(6) procedures per week; one respondent at a general hospital reported a mean volume of 15 procedures per week. After surgery, patients were typically cared for in the recovery room, although two interviewees from different hospitals explained that patients may receive postanaesthesia care in the operating room owing to the lack of a recovery room.

### Quality improvement

According to interviewees, 11 hospitals have organized activities to improve the quality of care, including establishing hospital monitoring committees and holding morning sessions and case reviews.

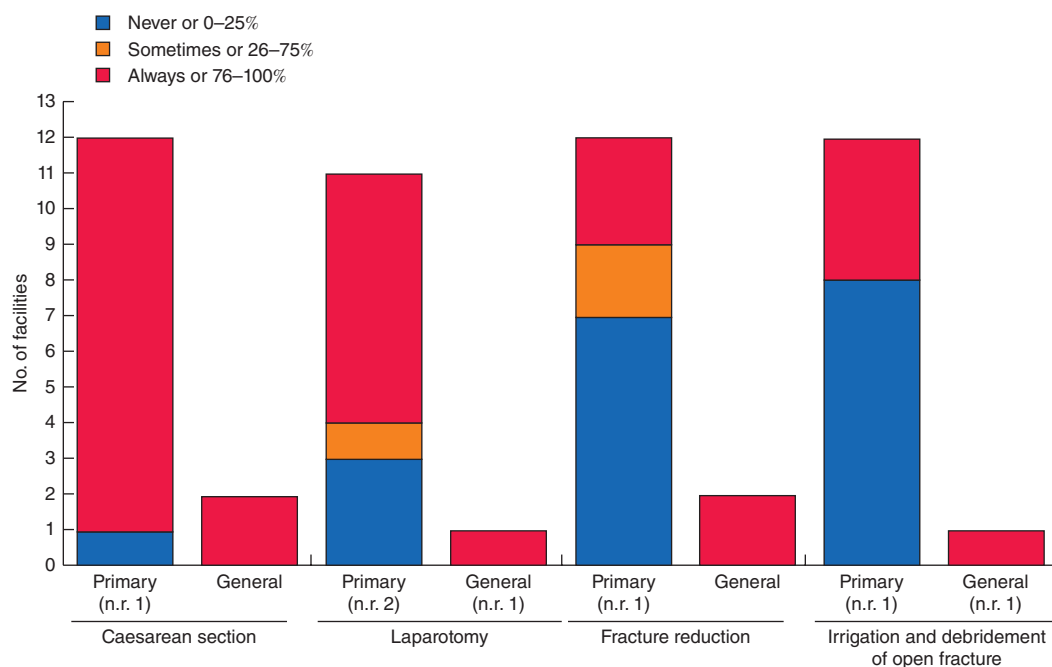
## Infrastructure

### Utilities

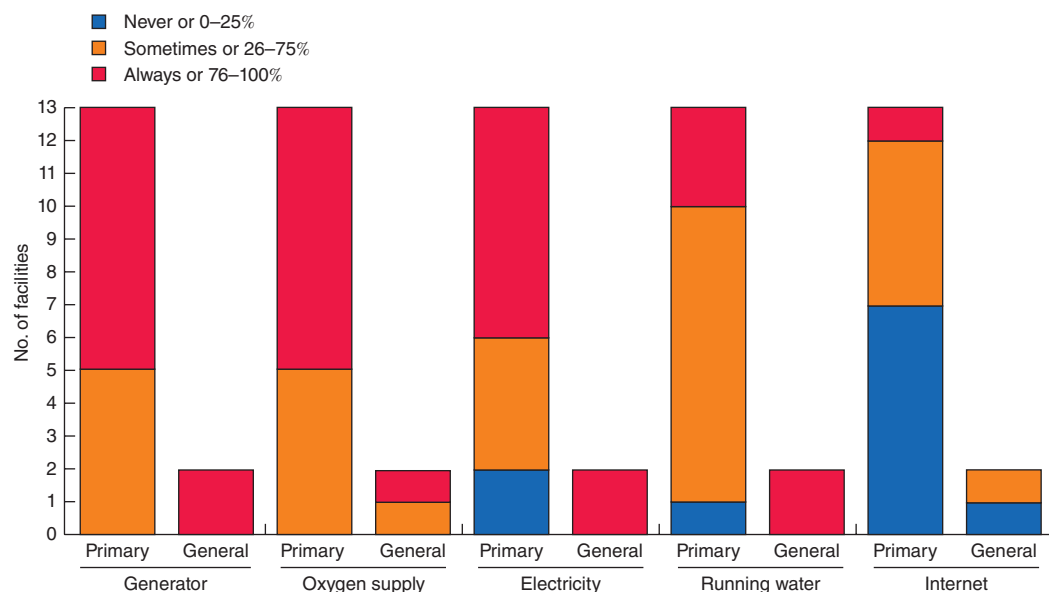
Basic utilities including generator, oxygen supply, electricity, running water and internet were not reliably available in all hospitals (*Fig. 4*). In interviews, respondents confirmed that an interrupted direct power supply was common (*Table 2*). Although use of a generator was common, interviewees indicated that it provided constant power supply only at a few hospitals. For example, one interviewee reported that generators are sometimes non-functional because of a lack of skilled staff to perform repairs, leading to referrals out of the hospital. Furthermore, relying solely on generators to provide continuous power can be expensive owing to the amount of fuel required. Interviewees reported similar challenges with water availability.

### Equipment

The availability of surgical equipment and supplies, including laboratory and imaging diagnostics as reported in the Hospital Assessment Tool, is shown in *Table*



**Fig. 3** Service delivery: availability of bellwether procedures by hospital level. n.r., No response



**Fig. 4** Infrastructure: availability of utilities by hospital level

S1 (supporting information). In qualitative interviews, respondents confirmed that hospitals are currently limited in their diagnostic capacity due to a lack of machines, delayed installation or prolonged downtime, which may contribute to large numbers of referrals out of the hospital. For example, external technicians are often hired to repair and install machines, although some maintenance

is handled internally by untrained staff. Additional equipment, including sterilization, laboratory and imaging apparatus, is needed (Table 2).

#### *Building structure*

Interviewees reported that hospital building design is often poor and buildings were not constructed appropriately



for functionality. Therefore, hospitals typically do not have adequate space to provide appropriate surgical care.

## Workforce

### *Surgical staffing*

Thirteen of the 15 hospitals had no specialist surgical physicians of any type on their staff, including surgeons, obstetricians or anaesthesiologists. However, non-physician providers such as Integrated Emergency Surgical Officers, a mid-level surgical provider in the Ethiopian health system, were reportedly always available 24 h per day to provide surgical services in eight of nine Amhara hospitals. In Tigray, three of five hospitals reported that a non-physician provider was available 24 h per day for 76–100 per cent of the time. Two hospitals in Tigray did not provide a response.

Interviewees identified staff shortages as a significant barrier to surgical services (Table 2). The lack of staff results in clinical providers working long hours without breaks, increasing the risk of burnout (Table 2). Two interviewees reported that their Regional Health Bureaus had a limited understanding of hospital staffing needs. Furthermore, interviewees employed at hospitals located in remote locations found it challenging to incentivize new hires. Thus, overworked staff tend to move to urbanized areas, often to work in private hospitals and receive higher remuneration.

### *Continuing medical education*

Less than half of the interviewees identified having access to professional training opportunities. Nurse and mid-wife training sessions organized by the Regional Health Bureaus were given as examples of available training. Short course training, seminars and workshops are occasionally available. Remaining participants found it challenging to access training opportunities, especially on-the-job training for surgical providers to improve skill sets. Nurse skills training, including operating room skills training and additional anaesthesia training, was also identified as a need. One interviewee suggested that skills learning from other facilities would be especially helpful.

## Information management

Hospital Assessment Tool results showed that five of nine hospitals in Amhara reported that data collection was always occurring and two of nine reported it as sometimes occurring. Three of five hospitals in Tigray reported data collection happening 75–100 per cent of the time. Eight of the 15 hospitals reported surgical volume data during the assessment.

All qualitative interviewees, representing all hospitals, reported regular tracking of patient data. A majority of interviewees were consistently performing prospective patient-level data collection, but with limited training (Table 2). Information systems often comprised both electronic and paper-based tools. Computerization of record keeping was usually for regional and national reporting purposes, using the Health Monitoring Information System. Of interviewees who responded to questions regarding research, most reported that there was little to no active research in their hospital and limited support for these activities (Table 2).

## Financing

### *Patient payments*

According to Hospital Assessment Tool results, formal mechanisms to reduce or eliminate out-of-pocket costs for surgical care, such as health insurance, are rare. In Amhara, seven of ten hospitals reported that less than 25 per cent of patients had health insurance. According to qualitative interviews, patients were entitled to free services (including medication) within the first 24 h of admission in an emergency, but payment was expected (Table 2). Although some health insurance plans were available or in development, many patients relied on free care, sponsored care and/or fee waiver systems to finance the cost of surgery if unable to pay out of pocket. Surgery-related costs for patients were based on fixed pricing categories.

### *Hospital budget*

According to interviewees, hospital financing and budgeting is managed by hospital administration, Regional Health Bureaus and the Federal Ministry of Health. The surgical team has limited control of their department's budget, as funding is not separated into department-level allocations (Table 2). Almost all interviewees reported there was inadequate financial support at regional and national levels. Funding received was often reported to be less than the amount requested or not allocated on time, resulting in budget shortages and a high reliance on internal hospital income to cover costs. Examples given for sources of internal income were innovative. One hospital ran an agriculture enterprise staffed by hospital employees to raise additional funds; however, most hospital-generated income was from patient out-of-pocket expenditure.

## Discussion

This study found deficiencies across all five essential health system domains in two regions of Ethiopia. This

highlights the need for a systematic, coordinated and comprehensive approach to improving the surgical system. The results also provided the background necessary to initiate Safe Surgery 2020 programmes in infrastructure, innovation, leadership, human resources, and monitoring and evaluation.

Reports that over half of patients in the majority of hospitals could reach the hospital within 2 h are in line with previous studies showing that approximately 50 per cent of Ethiopians have access to a public hospital providing emergency care<sup>22</sup>. Still, this falls short of the goal of 80 per cent of patients having access within this time frame<sup>1</sup>. Additionally, the present study reported that the benchmark bellwether procedures (caesarean delivery, laparotomy and treatment of open fracture – procedures determined to be essential markers for minimum surgical capacity) are not consistently provided at these primary-level facilities<sup>1</sup>. This demonstrates the need for an integrated approach to improve both patient access to and hospital availability of consistent surgical services at primary- and general-level hospitals.

Basic utilities needed for surgical services were found to be available inconsistently, which aligns with results of previous assessments of similar facilities in Ethiopia<sup>8,23</sup>. Availability of diagnostic equipment in this study was slightly lower than reported previously from Ethiopia, which showed that primary hospitals had an X-ray or ultrasound machine available about half of the time<sup>24</sup>. Issues with maintenance were similar to those in other developing countries, where nearly 40 per cent of surveyed equipment was found to be out of service at any given time<sup>25</sup>. This information was used by Safe Surgery 2020 to support the Saving Lives Through Surgery pillars of infrastructure and innovation. Surgical teams at ten facilities were enrolled in a 'facility accelerator fund' to address facility-specific needs. With this funding, teams were able to purchase equipment, make renovations, construct a waiting area and organize additional technical training. Complementing the fund, an 8-week biomedical technician training programme was implemented to improve capacity for equipment repair and maintenance for essential surgical equipment.

Surgical staff shortages in these facilities were universal. International targets for surgeon, anaesthesiologist and obstetrician density in Ethiopia have yet to be met, even when non-physician providers are considered, and despite almost a decade of initiatives to train a non-physician cadre to provide the majority of emergency surgical and anaesthesia care<sup>1,26–30</sup>. Consistent with a review of surgical task-shifting literature in the region, there were few opportunities for supervision, training and career progression<sup>31</sup>. Nurse anaesthetists have commented on the

absence of training opportunities as a barrier to quality care delivery<sup>32</sup>.

In partnership with the Federal Ministry of Health, Safe Surgery 2020 began a surgical leadership and mentorship programme to create an enabling environment for change at the hospital level. Anaesthesia training is being provided by the World Federation of Societies of Anaesthesiologists and Vanderbilt University Medical Center to address identified gaps in knowledge. Additionally, there is ongoing work to expand residency programmes and standardize surgery and anaesthesia training.

Similar to previous reports in Ethiopia, most hospitals reported regular data collection using both paper and electronic systems, noting limited capacity for collection and reporting activities<sup>8</sup>. This prompted an intervention to improve the quality of surgical data collection in these facilities. Fifteen key surgical indicators, including surgical volume and perioperative mortality rate, have been identified for incorporation into the national health information system. To support collection of these new indicators, intensive on-site training focused on developing a sustainable system for data collection, analysis and reporting was conducted as part of the national monitoring and evaluation plan for Saving Lives Through Safe Surgery.

Out-of-pocket payments for surgical care are common, as in previous literature indicating that nearly one-third of total health expenditure in Ethiopia comes from out-of-pocket payments, compared with 18.1 per cent worldwide<sup>33</sup>. A previous study<sup>34</sup> found the mean direct medical cost of surgical care to be 126 per cent of mean annual income per capita<sup>35</sup>. The present assessment was unable to ascertain exact patient costs associated with surgery in these facilities. To better address this, a patient survey is currently being piloted to obtain measures of catastrophic and impoverishing expenditure<sup>1,36</sup>. New government-led mechanisms for hospital financing are also under way, with the Amhara Regional Health Bureau expanding community-based financing for hospital care.

A strength of this study is the mixed-methods design. This is also one of few studies reporting largely on primary hospitals, of particular significance for Ethiopia as the majority of surgical care should be provided at the primary level<sup>6,8,23</sup>. Still, some limitations must be mentioned. Use of the Surgical Assessment Tool has limitations, such as response bias, recall bias and interviewer bias. The quantitative tool differed slightly between the two regions; for example, answer choices in Amhara were measured on a Likert-type scale, whereas in Tigray respondents were asked to denote their answers in quartiles on a scale from 0 to 100 per cent. Another limitation of using a standardized survey is that some questions were not relevant to the



Ethiopian context. As part of the Saving Lives Through Safe Surgery monitoring and evaluation pillar, a new Hospital Assessment Tool has been developed for the Ethiopian context and contains specific goals of the national surgical plan. This study was limited to the provider perspective only, so the patient voice is lacking. This is particularly pertinent for questions regarding the time it took patients to access care and affordability of services. Specific patient surveys have been found to be a valuable tool for this purpose<sup>36</sup>.

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### Supporting information

Additional supporting information can be found online in the Supporting Information section at the end of the article.