

SURGICAL CARE SYSTEMS STRENGTHENING

Developing national surgical,
obstetric and anaesthesia plans



PROGRAM IN GLOBAL SURGERY
AND SOCIAL CHANGE
Harvard Medical School



World Health
Organization

Surgical care systems strengthening: developing national surgical, obstetric and anaesthesia plans

ISBN 978-92-4-151224-4

© World Health Organization 2017

Some rights reserved. This work is available under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO licence (CC BY-NC-SA 3.0 IGO; <https://creativecommons.org/licenses/by-nc-sa/3.0/igo>).

Under the terms of this licence, you may copy, redistribute and adapt the work for non-commercial purposes, provided the work is appropriately cited, as indicated below. In any use of this work, there should be no suggestion that WHO endorses any specific organization, products or services. The use of the WHO logo is not permitted. If you adapt the work, then you must license your work under the same or equivalent Creative Commons licence. If you create a translation of this work, you should add the following disclaimer along with the suggested citation: "This translation was not created by the World Health Organization (WHO). WHO is not responsible for the content or accuracy of this translation. The original English edition shall be the binding and authentic edition".

Any mediation relating to disputes arising under the licence shall be conducted in accordance with the mediation rules of the World Intellectual Property Organization.

Suggested citation. Surgical care systems strengthening: developing national surgical, obstetric and anaesthesia plans. Geneva: World Health Organization; 2017. Licence: CC BY-NC-SA 3.0 IGO.

Cataloguing-in-Publication (CIP) data. CIP data are available at <http://apps.who.int/iris>.

Sales, rights and licensing. To purchase WHO publications, see <http://apps.who.int/bookorders>. To submit requests for commercial use and queries on rights and licensing, see <http://www.who.int/about/licensing>.

Third-party materials. If you wish to reuse material from this work that is attributed to a third party, such as tables, figures or images, it is your responsibility to determine whether permission is needed for that reuse and to obtain permission from the copyright holder. The risk of claims resulting from infringement of any third-party-owned component in the work rests solely with the user.

General disclaimers. The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by WHO in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by WHO to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall WHO be liable for damages arising from its use.



Halfdan T. Mahler, 1923-2016

This monograph is dedicated to the memory of Halfdan T. Mahler, former Director-General of the World Health Organization. Dr Mahler had an inspiring vision to provide "Health for all". He was the first true advocate for the provision of surgical care for the many, rather than the few. We thank him for his important contribution to improving the health of patients around the world.

Contents

| | |
|---------------------------------------|----------|
| Preface | v |
| Editors | vii |
| Contributors | vii |
| Acknowledgements | vii |
| Acronyms and abbreviations | ix |
| Executive summary | xi |
| Introduction | xiii |
| Part 1 - Getting a baseline | 1 |
| Defining the problem | 1 |
| Process components | 2 |
| The six core surgical care indicators | 2 |
| Data collection considerations | 2 |
| Data usage | 2 |
| Tracking and reporting | 2 |
| Ongoing surveillance | 2 |
| Case studies | 3 |
| Uganda | 4 |
| Madagascar | 8 |
| South Pacific | 12 |

| | |
|---|-----------|
| Part 2 - Facility assessments | 15 |
| Defining the problem | 15 |
| Process components | 16 |
| Choosing facilities | 16 |
| Data collection team development | 16 |
| Data collection – Surgical Assessment Tool | 16 |
| Data collection – Qualitative Interview Tool | 16 |
| Data interpretation | 16 |
| Case studies | 17 |
| Brazil | 18 |
| Viet Nam | 22 |
| | |
| Part 3 - National planning | 27 |
| Defining the problem | 27 |
| Process components | 28 |
| Committee development | 28 |
| Discussion Framework | 28 |
| Integration into current health strategy | 28 |
| National surgical, obstetric and anaesthesia forums | 28 |
| Costing | 28 |
| Monitoring and evaluation plan | 28 |
| Case studies | 29 |
| Zambia | 30 |
| Ethiopia | 33 |
| India | 38 |
| | |
| Summary and way forward | 43 |
| Annexes | 45 |
| 1: The Six Core Surgical Care Indicators | 45 |
| 2: Surgical Assessment Tool (SAT) | 45 |
| 3: Qualitative Interview Tool | 45 |
| 4: National Surgical, Obstetric and Anaesthesia Plan Template | 45 |
| 5: Discussion Framework | 45 |

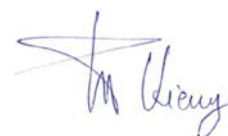
Preface

Clinical conditions requiring surgical, obstetric and anaesthesia services amount to approximately one third of the global disease burden, yet more than two-thirds of the world's population does not have access to safe, timely and affordable surgical and anaesthesia care. In the era of the Sustainable Development Goals (SDGs), this discrepancy is no longer acceptable. To “ensure healthy lives and promote well-being for all at all ages” (SDG 3), surgery must clearly form one of the critical components of public health and universal health coverage.

In 2015, an effort by all WHO Member States led to the unanimous adoption of World Health Assembly resolution 68.15. This resolution calls for a strengthening of emergency and essential surgical and anaesthesia services as a part of universal health coverage. The passing of this resolution sent a clear message: surgery is an indispensable part of health care. Since then, there has been an unprecedented interest within governments, ministries, professional societies, and on-the-ground clinicians to lead efforts to increase surgical, obstetric and anaesthesia care in their countries. These efforts are using facility- and country-level data to drive health policy. Ultimately, they are culminating in the development of national surgical, obstetric and anaesthesia plans, which are critical to ensuring country-wide implementation and scale.

In response to multiple requests, WHO has compiled a modular process algorithm with corresponding process components to enable countries to develop their specific plans. However, each setting requires a plan specifically designed to their immediate context, making every plan unique. To illustrate the variety of possible processes, we have compiled several case studies from a number of countries, each at different stages within their own algorithms. Representatives from these countries have presented the key challenges and tips for other countries pursuing similar efforts. So far, based on the gathered case studies, two principal components seem to favour success: broad, dynamic stakeholder engagement and strong ministry of health leadership.

We hope that this publication serves as a useful roadmap for countries to successfully address the gap of the five billion people around the world who currently lack access to timely, safe, and affordable surgical, obstetric and anaesthesia care.



Marie-Paule Kieny, PhD
Assistant Director-General
Health Systems and Innovation
World Health Organization, Geneva

Editors

Walter Johnson, Yihan Lin, Swagoto Mukhopadhyay, John Meara

Contributors

Contributors to individual case studies

Brazil – Julia Amundson, Saurabh Saluja, Vitor Moutinho, José Emerson dos Santos Souza, Rodrigo Vaz Ferreira, Nivaldo Alonso

Ethiopia – Kesetebirhan Admasu, Daniel Burssa, Abebe Bekele, Andualem Beyene, Kaya Garringer, Atlibachew Teshome, Abraham Endeshaw

India – Brian Till, Saurabh Saluja, Nakul Raykar, Siddarth David, Nandakumar Menon, Gita Mody, Jesudian Gnanaraj, Salim Afshar, Nobhojit Roy

Madagascar – Michelle White, Hery Andriamanjato, Mark Shrimme

South Pacific Region – Glenn Guest, Viliami Tangi, David Watters

Uganda – Katherine Albutt, Didacus Namanya, Geoffrey Anderson, Peter Kayima

Viet Nam – Duong Anh Vuong, Kristin Hatcher, Ruben Ayala, Barclay Stewart, Duc Hai Thi Nguyen, Thang Duc Nguyen, Khoa Trong Nguyen, Richard Vander Burg, Khue Ngoc Luong

Zambia – Emmanuel Makasa, Kennedy Lishimpi, Yihan Lin, Swagoto Mukhopadhyay

Acknowledgements

This publication is the result of a collaboration between the World Health Organization and the Program in Global Surgery and Social Change at Harvard Medical School.

We would like to thank the case study contributors who have made this publication possible.

We would also like to thank the following people for providing peer review and editorial expertise: Saurabh Saluja, Kee Park, Nakul Raykar and Laura Pearson.

Acronyms and abbreviations

| | |
|--------------|---|
| ASEAN | Association of Southeast Asian Nations |
| FMOH | (Ethiopian) Federal Ministry of Health |
| FRP | financial risk protection |
| HSDP | (Ethiopian) Health Sector Development Plan |
| HSTP | (Ethiopian) Health Sector Transformation Plan |
| LCoGS | Lancet Commission on Global Surgery |
| LMIC | low- and middle-income country |
| MDG | Millennium Development Goal |
| MOH | Ministry of Health |
| NHPSP | national health policy, strategy and plans |
| NSOAF | national surgical, obstetric and anaesthesia forum |
| NSOAP | national surgical, obstetric and anaesthesia plan |
| PGSSC | Harvard Program in Global Surgery and Social Change |
| PISA | Pacific Islands Surgical Association |
| POMR | perioperative mortality rate |
| RACS | Royal Australasian College of Surgeons |
| SAO | surgical, anaesthetic and obstetric |
| SAT | Surgical Assessment Tool |
| SDG | Sustainable Development Goal |
| UEA | Universidade do Estado do Amazonas (Brazil) |
| UHC | universal health coverage |
| WDI | World Development Indicators |
| WHA | World Health Assembly |
| WHO | World Health Organization |

Executive summary

Over 70% of the world's population cannot access essential surgical, obstetric and anaesthesia services (hereafter referred to as 'surgical system' or 'surgical care'). To address the severe lack of access to surgical care, concerned countries must consider national scale-up of surgical systems. In this publication, surgical systems strengthening is described as a three-step process, consisting of a baseline assessment, followed by facility assessments and finally national planning. This monograph provides recommendations and examples for each step of the process. Therefore, each section follows a similar structure: defining the problem, providing solution components to tackle the problem, and illustrating with case studies how each stage was completed in different countries around the world. Each case study also has a set structure: background on the current state of surgery in the country, description of the process followed in that country, major results from the process, as well as next steps.

1. Getting a baseline

The first case study describes the collection of surgical care indicators in Uganda. Where baseline data are not currently being collected, it is important to establish a standardized method to enable this important starting point. Indicator collection was piloted in one district

hospital in Uganda, and has since expanded to a representative number of public hospitals across the country.

In Madagascar, the Ministry of Health partnered with a nongovernmental organization to collect surgical care indicators from all district hospitals in the country. This process was tied to a country-wide WHO Surgical Safety Checklist training and implementation programme.

In the South Pacific region, countries have gone beyond simply reporting indicators at the national level. By working together to report information from around the whole Region, they have been able to create benchmarks among themselves, detect areas for improvement and identify high performers to learn from.

2. Facility assessments

Brazil has a robust publicly available national database which contains information on health care indicators. This greatly facilitated nationwide analysis of baseline surgical care indicators. However, when this data was further analysed and disaggregated into individual Brazilian states, it revealed great disparities in the delivery of surgical care around the country. Therefore, in the State of Amazonas, a detailed assessment of facilities has been carried out to determine how facilities can improve provision of surgical care.

In Viet Nam, the Ministry of Health partnered with a nongovernmental organization to perform facility assessments around the country. This information has been used to create minimum surgical quality standards nationwide.

3. National planning

Zambia was the first Sub-Saharan country to create a national health policy broadly addressing surgical care, entitled ‘The Zambian National Surgical, Obstetric and Anaesthesia Strategic Plan’ that was written into the National Health Strategic Plan for 2017-2021. This was a yearlong process involving extensive review of the published literature, stakeholder engagement, facility visits, committee meetings to develop priorities, and ultimately drafting and budgeting for the plan.

Ethiopia has developed a national surgical care programme, named SaLTS – Saving Lives Through Surgery. This includes indicators and minimum standards of surgical care throughout the country, and has also set goals and targets for the coming years.

In some countries, it is less feasible to create a nationwide plan. In India, for example, health policy is largely determined on a state-by-state basis. Therefore, this last case study describes an alternative way that practitioners and professional societies can work together to improve the surgical system in their country.

The final section of this monograph describes the way forward for different stakeholders invested in the process. At the local level, providers and professional societies represent the core working group of creating national surgical, obstetric and anaesthesia plans as well as the end-implementers. At the regional level, professional societies should advocate together to more effectively influence change and exchange ideas and resources. Nationally, the involvement and direction of ministries and Member States is critical to ensuring not only relevance, but implementation and scale-up. At the international level, WHO and other governing bodies must ensure that surgical, obstetric and anaesthesia care is not only included, but prioritized in health systems strengthening plans. Finally, partner organizations should recognize that such initiatives are already within their scope of work and should get involved and provide additional technical and financial support.

This monograph seeks to describe a handful of national processes which have already been implemented around the world, to provide recommendations for surgical systems strengthening and enable countries to learn from each other’s experiences. As illustrated by the case studies, there are many ways of improving surgical care globally. We hope that the synthesis of descriptions, learnings and recommendations found within these pages will empower yet more individuals, civil society and governments to act in concert to provide improved access to surgical care for the 5 billion people around the world who still lack access to it.

Introduction

The global community has long overlooked the central role of surgical and anaesthesia care in the achievement of resilient health systems. A recent academic study reported that, whereas a third of the global burden of disease results from surgical disease (1), an estimated five billion people worldwide do not have access to timely, safe, and affordable surgical and anaesthesia services (2,3). This crisis is magnified in low- and middle- income countries (LMICs), where two-thirds of the poorest countries receive just 6.5% of all surgeries performed (4).

Fortunately, there has been a call to action. In 2015, the World Health Assembly (WHA) unanimously passed resolution WHA 68.15 (5), highlighting the critical role of essential surgical and anaesthesia care in achieving universal health coverage (UHC). This resolution was well aligned with the transition from the United Nation's Millennium Development Goals (MDGs) to the Sustainable Development Goals (SDGs) (6), which call for a broader, systems-based approach to development. SDG 3 – "ensure healthy lives and promote well-being for all at all ages" – cannot be accomplished without a focused effort to significantly improve surgical, obstetric and anaesthesia care systems. Additionally, other research efforts, including the Disease Control Priorities, Third Edition (DCP-3), Vol. 1 Essential Surgery (7), as well

as the Lancet Commission on Global Surgery (LCoGS) Report (2), have provided the evidence confirming the enormous lack of surgical access, while highlighting the cost-effectiveness and economic benefits resulting from making surgical and anaesthesia services accessible to patients. These documents represent the political commitments, the economic evidence and the tremendous global need for strengthening surgical and anaesthesia services worldwide.

To solve the current surgical care crisis, governments must commit to significant and focused efforts to improve the availability, quality and affordability of surgery within their countries. These efforts should be supervised by ministries of health in concert with relevant stakeholders, including, but not limited to, the private sector, the nongovernmental sector, professional organizations, and not-for-profit sectors. A key demographic to include are local health care providers, who will ultimately lead the implementation of these efforts in their hospitals and communities. Equally important are the patients, who, as the other major end users of these policies, must be represented to ensure true accountability.

The culmination of these efforts should lead to a national surgical, obstetric and anaesthesia plan (NSOAP), which is fully integrated into

the national health policy, strategy or plan (NHPSP), as there is now global recognition that health systems planning is incomplete if the surgical system is left unaddressed. We, therefore, recommend this as a clear pathway to building quality and sustainable surgical care in that country.

In this publication, we refer to surgical care as an all-encompassing term for all surgical specialties, including obstetrics and gynaecology, as well as anaesthesia services. The purpose of this document is to describe the steps necessary to achieve surgical systems strengthening and the development of a NSOAP - through measurement, assessment, consensus-building and planning. We propose that to successfully address surgical care accessibility, quality, and cost, countries should engage in the following three steps:

1. national surgical system baseline assessment – this should be done through the collection of surgical indicators and should include a plan for ongoing surveillance;
2. facility assessments – this delves further into granular assessments than what the indicators can achieve in isolation and allows an evaluation of whether minimum standards are being met, while examining barriers to achieving these standards; and
3. national surgical, obstetric and anaesthesia plan – this begins with stakeholder engagement and consensus-building, and leads to the development of goals and targets to improve access and quality of care, which are incorporated within a country's overall NHPSP.

Ultimately, these recommendations need to be tailored to local needs and contexts. Many countries are already scaling up surgical services, with many others interested in

beginning this process. Therefore, within each section of this publication, we first describe the problem at hand, then recommend tools to help quantify and qualify the problem. Next we describe the process components necessary to implement these tools effectively, and finally we provide case studies from around the world as concrete examples to illustrate the process.

We hope that interested ministries of health will find relevance in this publication, and possibly even a good starting point, for taking steps to address the needs of their country's surgical system. Additionally, we hope to encourage and empower local champions, such as clinicians, professional societies and other stakeholders keen to improve their surgical, obstetric and anaesthesia care systems and in doing so elevate their health system.

References

1. Shrimpe MG, Bickler SW, Alkire BC, Mock C. Global burden of surgical disease: an estimation from the provider perspective. *Lancet Glob Health*. 2015;3 Suppl 2:S8-9.
2. Meara JG, Leather AJM, Hagander L, Alkire BC, Alonso N, Ameh EA, et al. Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development. *Lancet*. 2015;386:569–624.
3. Alkire BC, Raykar NP, Shrimpe MG, Weiser TG, Bickler SW, Rose JA, et al. Global access to surgical care: a modelling study. *Lancet Glob Health*. 2015;3(6):e316-23.
4. Weiser TG, Haynes AB, Molina G, Lipsitz SR, Esquivel MM, Uribe-Letiz T, et al. Estimate of the global volume of surgery in 2012: an assessment supporting improved health outcomes. *Lancet*. 2015;385:S11.
5. Resolution WHA68.15. Surgical Care Strengthening. In: Sixty-eighth World Health Assembly, Geneva, 18–26 May 2015. Resolutions and decisions, annexes. Geneva: World Health Organization; 2015:2 (WHA64/2015/REC/1).
6. United Nations Sustainable Development Goals. New York, NY: UN; 2015.
7. Debas HT, Donkor P, Gawande AA, Kruk M, Jamison DT, Mock C. Disease Control Priorities, Third Edition (Volume 1): Essential Surgery. World Bank Publications; 2015.

Part 1 - Getting a baseline

Defining the problem

Improving surgical, obstetric and anaesthesia care (here referred to as the 'surgical system' or 'surgical care') requires a better understanding of current state of the surgical care delivery systems in a country. Therefore, the first step to strengthening surgical care systems is by systematically and accurately measuring basic surgical indicators. Six core indicators have been suggested by the LCoGS (Annex 1). Although surgical care was previously absent from health and development indicators, as of 2015, all six

have been included in the WHO 100 Core Health Indicators. Four of these have also been adopted by the World Bank's 2016 World Development Indicators (WDIs). Together, these indicators provide a baseline from which countries can monitor and strengthen the role of surgical care as part of universal health coverage. They also provide a benchmark for ongoing surveillance and comparison with other countries in a given region.

| Category | Indicator | Definition (WHO/LCoGS/World Bank) | Target by 2030 |
|---------------|--|---|---|
| Timeliness | 2-hour access | Percentage of population that can access a surgical facility capable of performing the Bellwether procedures within two hours | Minimum 80% coverage |
| Capacity | Surgical, anaesthetic and obstetric (SAO) provider density | WHO: Number of licensed SAO providers per 1000 population | WHO: 0.2 per 1000 population |
| | | LCoGS/World Bank: Number of licensed SAO providers per 100 000 population | LCoGS/World Bank: 20 per 100 000 population |
| Capacity | Surgical volume | WHO: Number of procedures done in an operating theatre per 1000 population | WHO: 50 per 1000 population |
| | | LCoGS/World Bank: Number of procedures done in an operating theatre per 100 000 population | LCoGS/World Bank: 5000 per 100 000 population |
| Quality | Perioperative mortality rate (POMR) | Rate of death prior to discharge after undergoing surgical care | 100% tracking POMR |
| Affordability | Protection against impoverishing expenditure | Percentage of population protected from impoverishing expenditure from accessing surgical services | 100% protection from out-of-pocket payments |
| Affordability | Protection against catastrophic expenditure | Percentage of population protected from catastrophic expenditure from accessing surgical services | 100% protection from out-of-pocket payments |

Process components

1

The six core surgical care indicators

The six surgical care indicators mentioned above should be considered the minimum package for all countries to regularly report on at a national level. It is important that all six are considered when evaluating a surgical system, as the interpretation of these indicators relies on their interdependence rather than as individual metrics. For example, large surgical volume must be considered alongside indicators of affordability. A patient who becomes impoverished after surgical care potentially has their quality of life worsened, rather than improved, even though they have undergone a life-saving surgical procedure with improvement in overall health.

Additionally, countries that have the resources and are interested in collecting additional indicators can pursue these to understand the state of the surgical care systems in their country in greater detail.

2

Data collection considerations

Data collection must be done systematically, with integration into current data gathering mechanisms to ensure sustainable monitoring. A hierarchy of data sources should be adhered to. As much as possible, primary data should be collected to ensure accuracy and avoid bias. For example, to assess surgical volume, surgical log books should be used as the initial source of data. If log books are not available, the next most reliable source should be consulted, such as electronic medical records, anaesthesia records, or interviews with surgical theatre managers.

3

Data usage

Data on these indicators are collected at the facility level, but must be appropriately collated and analysed at the ministry of health to provide a baseline assessment for the entire country. These aggregate data should be used to direct health policy concerning surgical care. Furthermore, these data should be easily and readily disaggregated to determine where surgical care disparities are present in the country.

4

Tracking and reporting

Information on these indicators must be tracked and reported by all countries through their ministries of health, as well as international organizations such as the World Bank and WHO. As surgical indicators are now included in the World Development Indicator list, countries must ensure that these are systematically tracked and reported, to monitor progress. This information can also be used as a benchmarking tool against countries within the region or internationally, to highlight areas of success and areas of remaining or shifting need.

5

Ongoing surveillance

Surgical indicators are most useful if they are collected continuously, with corresponding analysis and interpretation. Therefore, we suggest that countries collect these indicators systematically and regularly depending on resource availability. This ongoing surveillance will serve to assess the impact of interventions and emphasize necessary areas of focus, including appropriate budgetary allocations.

Case studies



Republic of Uganda

This case study details a country-wide effort focused on the collection of surgical care indicators. It discusses the role of collecting accurate data in a system which does not currently have standardized processes in place for collecting this information.



Republic of Madagascar

The Malagasy Ministry of Health has partnered with an NGO, Mercy Ships, in the collection of surgical indicators, while simultaneously performing a country-wide WHO Surgical Safety Checklist training programme.



South Pacific*

Efforts have been made to collect indicators from each island nation in the South Pacific, to be used for regional benchmarking between countries. This effort highlights the role of professional societies collaborating with local governments and ministries.

** Australia, Cook Islands, Republic of Fiji, Republic of Kiribati, Federated States of Micronesia, Republic of Nauru, New Zealand, Independent State of Papua New Guinea, Independent State of Samoa, Solomon Islands, Democratic Republic of Timor-Leste, Kingdom of Tonga, Tuvalu, Republic of Vanuatu.*

Uganda

Authors: Katherine Albutt¹, Didacus Namanya², Geoffrey Anderson¹, Peter Kayima³

¹ General Surgery Resident, Department of Surgery, Massachusetts General Hospital, USA; Global Surgery Research Fellow, Program in Global Surgery and Social Change, Harvard Medical School, USA

² Health Geographer, Ministry of Health, Uganda

³ General Surgery Resident, Mbarara University of Science and Technology, Uganda

Background

Uganda is a land-locked country in Eastern Africa, straddling the Equator. It is administratively divided into four regions – Northern, Eastern, Western, and Central – which are further divided into 112 districts. With a population of approximately 36 million, Uganda ranked 163rd out of the 188 countries surveyed for the 2015 Human Development Index (1, 2).

Based on a hierarchy of increasing specialization, the health care system was decentralized in 1994. Since then, the Ugandan Ministry of Health has sought to establish one general hospital within each district. As of November 2016, there were 43 general hospitals, 14 regional referral hospitals, and two national referral hospitals, of which one is exclusively devoted to mental health. A majority of Ugandans who fall ill first seek health care from a public health facility (51%), followed by private and then private not-for-profit health facilities (3).

Despite health care being identified as a strategic priority, relatively little is known about the capacity of the health system to deliver essential surgical services. In fact, no nationwide data exist for the six core Lancet Commission on Global Surgery (LCoGS) surgical care indicators in Uganda. To better understand

the capacity of the health care system to deliver safe, timely and affordable surgical care, the Ministry of Health, in conjunction with the Program in Global Surgery and Social Change (PGSSC) at Harvard Medical School, embarked on a countrywide surgical capacity assessment.

Process

In 2016, a pilot project to determine a reproducible and scalable methodology for surgical care indicator collection was initiated at Mbarara Regional Referral Hospital, the second largest hospital in the country. Over the course of several months, surgical volumes and post-operative mortality rates were measured prospectively through direct observation in the operating rooms and surgical wards. This data was subsequently compared to data from logbooks and patient charts to determine the validity of retrospectively collected data. Interviews were conducted with surgeons, obstetricians and anaesthetists, as well as hospital directors, to determine the number of surgical, anaesthetic and obstetric (SAO) providers. Additionally, patient interviews were performed with almost 300 patients who had undergone surgical interventions in order to understand the proportion of patients who experience impoverishing and catastrophic expenditure from out-of-pocket payments for surgical and anaesthesia care.

Building on the successes of the pilot project, the next step was to undertake a nationwide surgical capacity assessment. A collaborative partnership was established with the Ministry of Health to ensure a comprehensive evaluation, access to facilities and applicability and accessibility of results at the country level. To attempt to understand the reality that surgeons face at the facility-level, a mixed-methods Surgical Assessment Tool (SAT) was employed at each of the selected hospitals. The assessment involved

a combination of hospital walk-throughs, retrospective reviews of operative logbooks and interviews with hospital directors and surgical providers.

To facilitate data collection and analysis, all quantitative data were recorded electronically using KoboToolbox – a platform allowing the quick and reliable collection of survey data on tablets and other devices, both online and offline. All data collected from retrospective 30-day reviews of operative logbooks, except patient identifiers, were manually coded in a comprehensive operative log database. The qualitative portion of the assessment was comprised of face-to-face semi-structured interviews of key stakeholders (including hospital directors and administrators, surgeons, obstetricians, anaesthesia providers and principal nursing officers) designed to understand the factors related to the provision of safe, timely and affordable surgical care. Interviews were recorded with a recording device and subsequently transcribed.

During the first phase of the capacity assessment, data was collected at 17 randomly selected representative hospitals around Uganda (eight general hospitals and eight regional referral hospitals – two facilities at each respective level of care per region, plus the national referral hospital) between August and November 2016. Data collection was conducted by a team composed of four researchers, including a global surgery fellow and research assistant from the PGSSC, a representative from the Ugandan Ministry of Health, and a Ugandan surgeon. Site visits were conducted at one facility per day and took an average of 4-6 hours.

The second phase of the project is still ongoing, and involves data collection at 16 randomized private and not-for-profit hospitals around the country.



© PGSSC/Maria PUNCHAK

Photo: Neurosurgeons at Mbarara Regional Referral Hospital identify anatomic landmarks for treatment of hydrocephalus

Results

Data from the pilot project revealed an estimated surgical volume at Mbarara Regional Referral Hospital of 8515 operations per year (4). Perioperative mortality rate at this hospital was found to be 2.4% overall and 4.6% for non-obstetrical operations. Retrospective analysis of operative and mortality logbooks proved to be a rapid, simple, accurate and effective way of capturing these metrics when compared to directly observed prospective data collection. Using this methodology, 99% of the operative volume and 94% of perioperative mortality was identified. Approximately two-thirds of patients were pushed into poverty or further into poverty as a result of undergoing an operation (impoverishing expenditure) and nearly one third of surgical patients experienced catastrophic expenditure (direct out-of-pocket payments of greater than 10% of annual household income) (5). More than half of patients had to borrow money, 21% sold possessions, 17% lost a job in order to meet surgical costs.

The country-wide public sector surgical capacity assessment captured information for public hospitals serving 64% of Uganda's population (6). On average, <25% of the population had two-hour access to a facility capable of

performing the Bellwether procedures - caesarean section, laparotomy and treatment of open fractures. Hospitals averaged 257 beds per facility and there were 0.2 operating rooms per 100 000 people. Annual surgical volume was 144.5 cases per 100 000 people per year, well below the targeted 5000 cases per 100 000. SAO density was 0.3 per 100 000 people in the public sector (target 20 SAOs per 100 000 population by 2030). Most hospitals reported electricity, oxygen, and blood availability >50% of the time and running water >75% of the time. Overall,

93.8% of facilities never had access to a CT scan, while sterile gloves, nasogastric tubes and Foley catheters, amongst other supplies, were frequently unavailable. Uniform outcome reporting does not exist and the WHO Surgical Safety Checklist is not being used. In summary, the Ugandan public hospital system does not meet LCoGS targets for surgical access, workforce, or volume. This project successfully captured the first national-level data on the core surgical indicators in Uganda and will now serve as the benchmark for future work.

| Lancet Commission on Global Surgery Indicators in Uganda's Public Sector | | | |
|---|---|--|----------------------------|
| Indicator | Uganda 2016 public sector | Target 2030 | % of target reached |
| Indicator 1: Access to timely essential surgery | <25% coverage of essential surgical and anaesthesia service | A minimum of 80% coverage of essential surgical and anaesthesia services by 2030 | 31.3% |
| Indicator 2: Specialist surgical workforce density | 0.3 SAOs per 100 000 people in the public sector | At least 20 SAOs per 100 000 population by 2030 | 1.5% |
| Indicator 3: Surgical volume | 144.5 procedures per 100 000 population | 80% of countries by 2020 and 100% of countries by 2030 tracking surgical volume; 5000 procedures per 100 000 population by 2030 | 2.9% |
| Indicator 4: Perioperative mortality rate | 2.4% POMR* | 80% of countries by 2020 and 100% of countries by 2030 tracking perioperative mortality. In 2020, assess global data and set national targets for 2030 | N/A |
| Indicator 5: Risk of impoverishing expenditure for surgical care | 60% impoverishing expenditure* | 100% protection against impoverishment from out-of-pocket payments for surgical and anaesthesia care by 2030 | 40.0% |
| Indicator 6: Risk of catastrophic expenditure for surgical care | 32% catastrophic expenditure* | 100% protection against catastrophic expenditure from out-of-pocket payments for surgical and anaesthesia care by 2030 | 68.0% |

* Based on data obtained at Mbarara Regional Referral Hospital during the pilot project, not yet obtained for the national level.

Next steps

With data collection for the public sector complete, the next step is to conduct a capacity assessment to capture those surgical services provided in the private and not-for-profit settings. When completed, this will provide a more complete picture of surgical service provision in Uganda and allow comparisons between the public and private sectors.

Understanding the current strengths and shortfalls of Uganda's surgical system is a critical first step in developing effective and targeted strategies that will build and strengthen its surgical capacity. Critical policy and programmatic developments are essential to build surgical capacity and facilitate provision of safe, timely and affordable surgical care.

Key successes

1. Represents the first collection of quality country-wide surgical metrics for Uganda.
2. Captured experiences from front-line providers regarding the challenges inherent in the provision of safe, timely and affordable surgical care and facilitated an enhanced understanding of the complexities and nuances embedded within the surgical system.
3. Established collaborative and ongoing partnerships that will facilitate change and serve to underpin any future efforts to improve access to safe surgery in Uganda. Critical collaborations emerged between the PGSSC and the Ministry of Health, as well as between researchers, clinicians, and policy makers in the field, which have helped identify and recruit advocates and champions for safe surgery.

Key lessons learned

1. Retrospective analysis of operative and mortality logbooks is a simple, accurate and effective method to capture operative volume and POMR.
2. Capturing information about impoverishing and catastrophic out-of-pocket expenditure resulting from surgery is incredibly challenging. In a context which lacks consistent user fees, out-of-pocket expenditures are significant, variable and incredibly difficult to measure.
3. Undertaking a country-wide surgical capacity assessment is resource and time intensive. In a resource-limited setting such as Uganda, directly measuring and accessing surgical metrics through hospital site visits requires a lot of upfront planning and communication, adequate time to travel and conduct the assessments and the financial and personnel resources necessary to support these activities. Attention must be paid to minimizing any additional burden to already overburdened providers.

References

1. 2015 Statistical Abstract. Kampala: Uganda Bureau of Statistics; 2015.
2. Human Development Report 2015. Geneva: United Nations Development Program; 2015 (<http://hdr.undp.org/en/2015-report>, accessed 3 February 2017).
3. Annual Health Sector Performance Report 2015/2016. Kampala: Ministry of Health of the Republic of Uganda; 2016.
4. Anderson GA, Ilcisin L, Abesiga L, Mayanja R, Portal Benetiz N, Ngonzi J et al. Surgical volume and postoperative mortality rate at a referral hospital in Western Uganda: Measuring the Lancet Commission on Global Surgery indicators in low-resource settings. *Surgery*. 2017; Mar 1 [Epub ahead of print].
5. Anderson GA, Harvard Program on Global Surgery and Social Change, unpublished data, 5 February 2017.
6. Albutt K, Harvard Program on Global Surgery and Social Change, unpublished data, 5 February 2017.

Madagascar

Authors: Michelle White¹, Hery Andriamanjato², Mark Shrimme³

¹ Deputy Chief Medical Officer, Mercy Ships, Madagascar; Department of Anaesthesia, Great Ormond Street Hospital, UK; Honorary Senior Lecturer, Institute of Child Health, University College London, UK

² Directeur du Partenariat, Ministère de la Santé Publique, Madagascar

³ Research Director, Program in Global Surgery and Social Change, Harvard Medical School, USA; Department of Otolaryngology, Harvard Medical School, USA; Office of Global Surgery and Health, Massachusetts Eye and Ear Infirmary, USA

Background

Madagascar is a large island nation off the southeast coast of Africa, with a population of 23 million, 66% of whom live in rural areas (1). The country is divided into 22 regions, each with a regional referral hospital. In seven of the regions, the referral hospital is also a university hospital. Most surgery takes place in the regional referral hospitals, although some district hospitals provide caesarean sections and minor operations.

Medical training consists of eight years in medical school, the last three of which are worked as a *médecin généraliste* (general practitioner). The *médecin généraliste* performs basic medical (non-surgical) duties but may also assist during surgeries. There are two pathways to becoming a surgeon: a two-year programme called the *diplôme universitaire* or DU (university diploma); or a four-year programme resulting in the doctor becoming a *spécialiste avancé* (advanced specialist). There is general consensus in the country that surgeons with the DU are not considered fully fledged 'specialists' even though many undertake laparotomies, caesarean sections and various orthopaedic procedures

in their regular work. About 60 surgeons graduate from the DU programme every year, compared with just four general surgeons, four obstetricians and one neurosurgeon per year becoming *spécialistes avancés*.

Mercy Ships is an international charitable organization operating the world's largest nongovernmental hospital ship. The ship visits coastal African countries at the invitation of the President of each country and works closely with the Ministry of Health to provide free surgeries, training and quality improvement initiatives. From October 2014 to June 2016 Mercy Ships was based in Madagascar.

Process

Initial planning

In December 2014, Mercy Ships began planning a country-wide implementation of the World Health Organization's Surgical Safety Checklist (SSC), in conjunction with the Ministry of Health (2).

Following publication of the Lancet Commission on Global Surgery (LCoGS) report (3), the authors collaborated to enable a member of the Harvard Medical School's Program in Global Surgery and Social Change (PGSSC) to join the Mercy Ships SSC implementation team and use the SSC training as a platform for collecting core surgical indicators.

Data collection of key surgical indicators

The SSC project team consisted of three to five people, including two Malagasy generalist practitioners. The aim was to visit 25 hospitals, of which five were university hospitals, in 20 of the 22 regions, from September 2015 to April 2016. Two university hospitals were pilot sites for the SSC implementation; repeat visits were not planned. Due to pilot illness and bad weather, surgical indicators were collected at only 22 of the 25 planned hospitals, in 16 regions, were visited. A total of 17 hospitals were situated outside the capital city, three

being university hospitals. The five other university hospitals are situated in the capital Antananarivo.

During the three-day SSC training course, the six surgical indicators were collected from each regional hospital through semi-structured interviews with relevant staff (hospital directors; surgical, anaesthesia, radiology, laboratory and pharmacy staff; technical assistants; cashiers; and hospital statisticians). Interviews lasted between 30 minutes and three hours each. Initially, Mercy Ships designed a semi-structured interview tool with electronic data capture to collect all six core indicators. However, over the course of the project, a PGSSC working group created a standardized semi-structured interview tool that was subsequently used in the later stages of data collection.

On arrival at each hospital, courtesy visits were paid to the offices of the regional Minister of Health and the regional referral hospital Director to confirm permission and gain support for both the SSC implementation and LCoGS data collection interviews. Good relationships with the Ministry of Health and the presence of an on-the-ground team for seven months (September 2015-April 2016) allowed for baseline data collection in a short time frame. All interviewees were willing to be interviewed and gave data freely. This is attributable to several factors: (i) a high level of support from the Ministry of Health; (ii) the good reputation of Mercy Ships, developed through free surgical training and delivery; and (iii) the fact that data collection was coupled with SSC training.

Standard definitions of the surgical indicators were used (3) and a detailed description of the methodology has been published (4). For indicator 1, hospitals in Madagascar do not record the time taken for a patient to access their facility; therefore, multiple interviews (to reduce recall bias) were conducted asking

participants to estimate this. Workforce density (indicator 2) was calculated using only the numbers of anaesthetists and *spécialistes avancés* surgeons, as well as obstetricians; those with only a DU were excluded. Population data were taken from the World Bank (5). Data for surgical volume and perioperative mortality (indicators 3 and 4) were obtained from hospital statisticians and operating room registries. To calculate values for indicators 5 and 6, micro-simulation modelling was used based on the total cost of a caesarean section. The observed total cost (including informal payments) was based on data from three different regions of Madagascar for a pregnant woman in obstructed labour for two days living at least 40 kilometres from the nearest surgical facility.

National surgical plan development

At the start of the project, there was no roadmap for creating a national surgical plan. Mercy Ships planned preliminary discussions with the Ministry of Health for the mid-way point in December 2015 with the aim of defining next steps.



Dr Andriamanantena and Dr Shrimie performing head and neck surgery

© Mercy Ships/Katie Callow

In March 2016, the PGSSC organized a symposium in Dubai which was attended by representatives from Mercy Ships and the Malagasy Ministry of Health. The symposium helped define practical next steps to develop a national surgical plan. Mercy Ships continued to hold regular meetings with the Ministry of Health from March to June 2016 to encourage ideas from the symposium to be realized as part of a national surgical planning forum.

Results

Data from the core surgical indicator assessment showed that 29% of the population of Madagascar can access a surgical facility within two hours; surgical workforce density is 0.78 providers per 100 000 population; annual surgical volume is 135-191 procedures per 100 000 population; and perioperative mortality is 2.5-3.3% (4). Mercy Ships left Madagascar in June 2016 but handed over key aspects of the national surgical planning process to Jhpiego, an international NGO with an established presence in Madagascar since 2003. This was an important transition to maintain momentum on the ground as Jhpiego also has several joint projects and good relationships with the Ministry of Health.

In September 2016, the Ministry of Health, with support from Jhpiego, organized a two-day national surgical planning forum. Senior clinicians, representatives of medical professional societies, hospital directors, directors from the different departments within the Ministry of Health and other charitable and financial partners (WHO, UNICEF, USAID, World Bank, UNFPA, Agence Française de Développement, Banque Africaine de Développement, Harvard University, Japan International Cooperation Agency and Mercy Ships) were invited. Financial data from the LCoGS indicator assessment was presented to

the Ministry at this meeting, which showed patients requiring surgery have a 77.4-86.3% and 78.8-95.1% risk of incurring impoverishing and catastrophic expenditure respectively (4). Technical workgroups were set up to discuss priority areas in the five domains of the national surgical plan: infrastructure, workforce, surgical volume, finance and information management. Outcomes from the meeting highlighted the need for blood donation awareness, implementation of blood transfusion centres, strengthening numbers and capabilities of personnel, increasing the budget for health care, and computerized data collection.

Next steps

As a result of the September national surgical planning forum, the agreed next steps were (i) to appoint someone to take on the role of National Surgical Plan Co-ordinator; (ii) to develop technical working groups to finalize recommendations; and (iii) to meet with financiers (planned for late 2016/early 2017). Mamy Lalatiana Andriamanarivo, the Minister of Health, committed to changing 'the world of surgery in Madagascar to satisfy the needs of users, especially in the remotest areas, under a policy of reform of the health system' (6).

The technical working groups met in November 2016 and defined their terms of reference under the guidance of the Director of Partnerships at the Ministry of Health. They also appointed a urologist to take over leadership of the National Surgical Plan, and USAID in partnership with Jhpiego agreed to support the plan by financing the appointment of host nationals to help with administration and logistics. Current next steps include the finalization of technical committee recommendations and financial commitments from internal and external sources.

Key successes

1. A trusting relationship between the Madagascar Ministry of Health and the implementing nongovernmental organization, Mercy Ships, helped promote the concept of a national surgical plan.
2. A strong partnership between the implementing NGO and an academic institution, the Harvard PGSSC, enabled academic input and skills to be shared with the Ministry of Health giving credibility to the national surgical plan.
3. Using an ongoing, nationwide, quality improvement initiative (implementation of the WHO Surgical Safety Checklist) facilitated data collection of surgical indicators.

Key lessons learned/challenges

1. Ministries of Health have many competing priorities and safe, affordable surgery is just one of many targets they are trying to achieve with very few resources.
2. Concepts such as the WHO Surgical Safety Checklist and the Lancet Commission on Global Surgery are still relatively new, therefore governments need time to 'buy-in' to the health and economic benefits of safer surgery.
3. Establishing suitable financial partners to execute the national surgical plan is a necessary part of the process.

References

1. Data WHO GHO. <http://www.who.int/gho/countries/mdg.pdf?ua=1> (accessed March 10th 2016)
2. World Health Organisation. http://www.who.int/patientsafety/safesurgery/tools_resources/SSSL_Manual_finalJun08.pdf (accessed August 12 2016)
3. Meara JG, Leather AJM, Hagander L, Alkire BC, Alonso N, Ameh EA, et al. Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development. *Lancet*. 2015;386:569–624.
4. Bruno E, White MC, Baxter LS, et al. An Evaluation of Preparedness, Delivery and Impact of Surgical and Anesthesia Care in Madagascar: A Framework for a National Surgical Plan. *World J Surg*. 2016; Nov 30 [Epub ahead of print].
5. World Bank Subnational Population database. World Bank 2014. <http://databank.worldbank.org/data/reports.aspx?source=subnational-population> (accessed July 23 2016)
6. <http://www.newsmada.com/2016/09/08/chirurgie-vers-une-politique-nationale/>

South Pacific

Authors: Glenn Guest¹, Viliami Tangi², David Watters³

¹ Director of Australia Timor-Leste Specialist Support Scheme (ATLASS), Royal Australian College of Surgeons (RACS) Global Health, Professor of Surgery, Barwon Health and Epworth Hospital, Deakin University, Australia

² President Pacific Islands Surgical Association, Former Deputy Prime Minister of Tonga and Former member of WHA Executive Board, Tonga

³ Immediate Past President of Royal Australian College of Surgeons, Alfred Deakin Professor of Surgery, Barwon Health and Deakin University, Australia

Background

The South Pacific Region consists of multiple nations spread across a vast area of the Pacific Ocean, with some individual island nations occupying an area of ocean approximately the size of the continental USA. Although distance, language, technology and culture have the potential to impede communication and cooperation between these states, there has been long-standing collaboration between them, supported by regional colleges and professional institutions.



© RACS/Michael Cooper

Dr Albert Shun and Dr Okti Poki performing paediatric surgery to correct major deformity in Papua New Guinea

Process

In October 2015, the Royal Australasian College of Surgeons (RACS) organized its triennial international symposium around responding to WHA resolution 68.15 and the recommendations of the Lancet Commission of Global Surgery (LCoGS). This meeting was attended by several Pacific Island nations and Association of Southeast Asian Nations (ASEAN) surgical college representatives and anaesthetists. All countries involved agreed to prioritize increasing access to safe, affordable surgical and anaesthesia care.

Establishing the need for surgical data

It was agreed that the first important step was to collect data on the six surgical indicators to establish a reference point. All countries volunteered to collect and share their data based on mutual determination to use these metrics to inform local surgical, anaesthesia and obstetric planning and address the problems arising from lack of access to safe, affordable and timely surgical care.

Establishing a collaborative working group

The inadequacies of current data from the Region were acknowledged, as well as challenges of standardizing data collection due to the diversity between Member States in the Region. Therefore, a collaborative working group was developed with representatives from 18 countries. This working group met by teleconference and received some advice and guidance from LCoGS commissioners and authors.

Ensuring data standardization

While the exact methodology varied between nations, given the different sources of data and data mining technologies, the collaborative approach provided motivation, a problem-solving forum and an opportunity to clarify definitions related to the local context. This was particularly relevant as it was found that although the initial definitions of the indicators

seemed quite clear and conceptually robust, the process of actually collecting the data revealed unforeseen challenges in identifying what actual data to collect.

For example, in the case of the first Lancet indicator – 2-hour access to a facility able to perform the Bellwether procedures – the definition was further qualified to include hospitals able to perform surgery most of the time, and the 2-hours' travel time was defined as a travel distance using commonly available modes of transport, including boats. Seasonal disruptions to access, such as flooding or road blockages, were discounted even when these were regular local events.

Regarding surgical, anaesthetic and obstetric (SAO) providers, only physician providers were included, although, in some of the countries nurse anaesthetists provide a high proportion of the anaesthesia care. Most of the LMICs in the Region have a number of visiting specialist teams which work in the country for one to two weeks at a time, but these were not included in the SAO numbers. However, in the case of surgical volume, the LCoGS definition (counting all cases performed in an operating theatre) was used, regardless of whether these were performed by local surgeons or visiting teams.

Data collection

Each country had a representative responsible for accuracy of the local data. Data collection raised challenges to be overcome, as there had not previously been routine collection of the data to derive these indicators. For example, although some countries had annual hospital reports which contained information on operative volume and surgical postoperative deaths, this information was often not summated in ministries of health. The data was generally collected through theatre log books and monthly operating theatre reports for surgical volume. Numbers of SAO providers were obtained either from the medical

registry, the hospital administration, or in small countries with a small number of hospitals provided by a senior medical administrator or specialist based on actual staff numbers.

In smaller island nations, with populations under 500 000, a few local champions were the leading specialist physicians who generally had access to local data sets, whether paper-based or electronic. In larger nations with multiple regions, this required representatives to agree to collect the data initially and for the health department or another agency to take the lead in asking for the data to be submitted and making it part of the reporting experience. Frequently, data collectors needed training in methods of the data tool.

Data analysis

The metrics were compiled and standardized at the Royal Australasian College of Surgeons, in the Global Health department.

Results

Of the eighteen countries that agreed to collaborate, fourteen collected and reported results on the indicators six months later, at the RACS Annual Scientific Congress, in May 2016. These participating countries included Australia, Cook Islands, Fiji, Kiribati, Micronesia, Nauru, New Zealand, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga, Tuvalu, and Vanuatu. Of the 14 participating countries, thirteen provided reports on the first four core surgical indicators. Australia and New Zealand achieved the target for all four indicators. Five countries (36%) reached the LCoGS target of 2-hour Bellwether access for 80% of the population, whilst the others ranged from 20% (Papua New Guinea and the Solomon Islands) to over 65% (Fiji). Five countries (36%) reached the target of 5000 surgical procedures per 100 000 population, but seven performed fewer than 1600. For surgical, anaesthesia obstetric (SAO)

workforce, only four countries had at least 20 per 100 000 population, whilst eight ranged from 0.9 (Timor-Leste) to 8.2 (Kiribati). All the participating countries reported their perioperative mortality rate (which ranged from 0.11 to 0.96%).

Next steps

The regional Pacific Islands Surgical Association (PISA) meeting, held in Samoa in September 2016, gathered representatives from across the South Pacific Region. Presentations were made on the surgical metrics and an agreement was reached to progress to national surgical, obstetric and anaesthesia planning with the individual governments and their ministries of health. The meeting also resolved to collect financial risk protection (FRP) data, and study survey forms were distributed. Currently, only modelled FRP is available, however in 2017, the region plans to report on these indicators in order to reveal how often surgical care causes catastrophic expenditure and/or impoverishment.

It is also important to set standards for continued data collection to uniformly monitor progress. The group will need to determine what the

interval for reporting is for each indicator, and ensure that the indicators are being used to monitor health plans and used to develop NHPSPs which include surgical, anaesthetic and obstetric care. There is still advocacy required to safeguard that these metrics are collected as part of the system rather than the individual efforts of enthusiasts, ensuring that when electronic systems are introduced these include the data points of the required metrics.

Acknowledgements

The following country representatives were part of the working group:

Australia (Glenn Guest), Cook Islands (Deacon Teapa), Fiji (Jemesa Tudravu), Kiribati (Tuneti Kabiri), Micronesia (John Hedson), Nauru (Bwabwa Oten), New Zealand (Leona Wilson), Papua New Guinea (Noah Tapaua), Samoa (Ponifasio Ponifasio), Solomon Islands (Douglas Pikacha), Timor-Leste (Eric Vreede), Tonga (Viliami Tangi), Tuvalu (Samson Mesol), Vanuatu (Basil Leodoro), and RACS members (Stephanie Korin, Liz McLeod, Will Perry, David Watters).

Key successes/tips

1. Local partners and long-term strategic planning are essential for instilling national ownership of the data collection and policy development process.
2. Long-term goals must be consistently coupled with flexibility and the practice of giving credit to all partners who have contributed to the combined effort.
3. Reporting POMR is one of the most motivating indicators for surgeons and anaesthetists and engages them in the process of collecting data and inspires them to provide leadership.
4. Academic and professional institutions, such as RACS and PISA, can play an important leadership and coordinating role in data collection and health systems strengthening.

Key lessons learned/challenges

1. Data collection across multiple countries in a region must be standardized to ensure the data can be used for benchmarking purposes.
2. Surgical volume data should be collected in tandem with a measure of the system's safety (such as via the POMR).
3. At the health ministry level, efforts are still being made to convince those running the health system that collecting and using these health metrics will result in both better health and economic improvements. Usually the problems facing health systems are acknowledged in health plans; and surgery is an indivisible and indispensable part of any health system.

Part 2 - Facility assessments

Defining the problem

System-wide facility level assessments are essential to understanding the availability and quality of critical components of safe surgical, obstetric, and anaesthesia care. These include infrastructure, workforce, service delivery, financing and information management. These components must be assessed together as the nucleus of the surgical care system. This ensures that the surgical care plan is based on evidence from the beginning, and is subsequently effective and integrated within the broader health system. Furthermore, focused qualitative assessments on representative hospitals can be collected to provide a greater depth of information and potentially identify considerations which have not been captured through strict quantitative assessments.

Although these assessments include the basic data necessary to calculate the previously mentioned indicators, they gather additional information that can inform operational changes ranging from departmental to facility, and up to the regional and national levels.

Process components

1

Choosing facilities

The scope of surgical care systems strengthening should be ensuring that appropriate surgical care at all levels of hospitals is available. However, in resource constrained settings, a focus on district hospitals (first-referral hospitals) may be necessary, as these are usually the most accessible to patients and remain the foundation of the surgical referral system.

Data would ideally be reported from all facilities, but, quite often, data collection is not comprehensive due to cost constraints and issues around lack of human resources and time. Therefore, using a rigorous sampling strategy to ensure selected hospitals are representative of the entire country is critical. Important considerations include levels of care, geographical spread, hospital type based on the source of support e.g. public versus private, as well as populations served.

2

Data collection team development

Most health systems have teams that collect, analyse and report data, however, the makeup of these teams can vary tremendously. Teams must be adequately trained to ensure standardization of the data collection process. If possible, teams should include ministry of health representation, but if this is not possible, the MOH should oversee and provide input into the process prior to data collection. Ideally, the collection team should include a health care provider who is familiar with the district level hospital setting, although in settings where the workforce is limited, lesser qualified providers will need to be used. Minimal credentials should be defined in advance and adhered to as far as possible, such as having a medical trainee or a senior level medical student on the team. At least one team member should be able to fluently speak the various dialects or languages that will be encountered during the exercise.

3

Data collection – Surgical Assessment Tool

To assess surgical care readiness, individual hospital assessments should be carried out to determine each hospital's ability to perform safe surgery. WHO and the PGSSC have developed a complete survey tool framed around the following five domains: infrastructure, workforce, service delivery, information management and financing. This tool is called the Surgical Assessment Tool (SAT) and can be found in Annex 2. This tool is ideally used as a hospital walk-through tool, with teams gathering information in real time in collaboration with local hospital teams.

4

Data collection – Qualitative Interview Tool

A qualitative component of the surgical capacity tool has also been developed consisting of open-ended interview questions that allow a deeper understanding of the surgical systems and policy effects at the hospital level. The results of the quantitative tool should be considered alongside the qualitative tool to ensure maximum relevance and accurate interpretation of the data collected.

The Qualitative Interview tool can be found in Annex 3.

5

Data interpretation

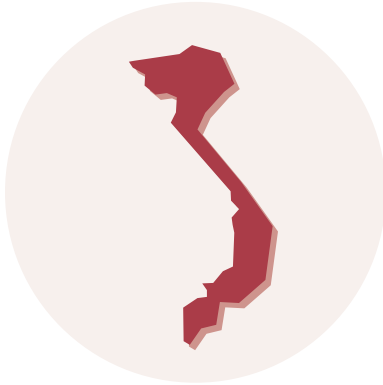
Data quality must be standardized for accurate interpretation. It is important to integrate both quantitative and qualitative data during the analysis phase. Aggregated national data must be examined in context and individual facility or regional data must be analysed separately to avoid erroneous generalizations. However, protections should be in place to ensure that no punitive action is taken in the event of negative findings coming to light. This will serve to ensure greater accuracy of data and unbiased reporting.

Case studies



Federative Republic of Brazil

In Brazil, a detailed analysis of aggregated country-level indicator data revealed significant disparities in surgical care between and within the different Brazilian states. Therefore, a systematic sampling of hospitals in the Amazonas State has been undertaken to further quantify and qualify the realities behind the uneven distribution of surgical services in the country.



Socialist Republic of Viet Nam

In Viet Nam, the Ministry of Health partnered with Operation Smile to undertake the Safe Surgery Initiative. Facility-level assessments have culminated in the implementation of minimum surgical quality standards for the whole country.

Brazil

Authors: Julia Amundson¹, Saurabh Saluja², Vitor Moutinho³, José Emerson dos Santos Souza⁴, Rodrigo Vaz Ferreira⁴, Nivaldo Alonso⁵

¹ Research Associate, Program in Global Surgery and Social Change, Harvard Medical School, USA

² Global Surgery Research Fellow, Program in Global Surgery and Social Change, Harvard Medical School, USA

³ Surgeon, Brazilian Army, Ministry of Defense, Brazil

⁴ Associate Professor of Surgery, Universidade do Estado do Amazonas, Brazil

⁵ Associate Professor, Department of Plastic Surgery, University of São Paulo, Brazil

Background

Brazil, the fifth most populous country in the world with the ninth largest GDP, is home to more than 200 million people, heterogeneously distributed in areas of low and middle income (1). The first meeting of key stakeholders from the Brazilian surgical community was held in 2014, hosted by the University of São Paulo. This sparked surgical system evaluations in Brazil (2), which began via a series of interviews conducted with medical providers ranging from nutritionists to surgeons, representing four of the country's five major regions. Results of this pilot study in turn laid the groundwork for collaborations with the authors of *Demografia Médica* (3,4), a publication detailing the medical workforce in Brazil.

With this more in-depth understanding of the surgical system in Brazil, reporting of the six indicators put forth by the Lancet Commission on Global Surgery began (5). This was largely able to be done with previously collected data through DATASUS, a public national database. This study demonstrated that Brazil's public sector meets several key benchmarks of surgical system strength but suffers from substantial regional

disparities (6). The South and South Eastern states easily met benchmarks, however the North and North Eastern states fell well-short. For example, while São Paulo state in the South East has a workforce of 48 surgical, anaesthetic and obstetric (SAO) providers per 100,000, the North Eastern state of Maranhão has only 11.

Moreover, while the developed status of Brazil's health information management system and universal health care system eased the collection of all six indicators, the researchers noted discrepancies between the summative reporting of the data and the on-the-ground reality, especially in poorer regions of Brazil. Collectively, these initial studies prompted researchers to move beyond a macro-level understanding of surgical care in the country, towards a deeper understanding of issues of disparity, access and quality.

Process

Understanding the true surgical capacity of Brazil required reaching collaborators outside the urban South East region of Brazil and focusing on areas where public health care comprises the majority of services rendered. To do this, a project was launched in northern Brazil, through an academic partnership with the Universidade do Estado do Amazonas (UEA). Amazonas is the largest Brazilian state by landmass, where much of the population is connected primarily via river systems throughout the rainforest. This transportation reality leads to unique challenges regarding access to surgical care, particularly for the 52% of the population living outside the metropolitan areas surrounding the capital Manaus, where 92% of the SAO workforce is concentrated (4).

A mixed-methods, quantitative and qualitative, surgical assessment tool (SAT) was created to identify priority areas for system improvement and health policy changes, as perceived by local providers. For deployment in Amazonas,

municipalities performing surgery were stratified by population quartile and 20 municipalities were selected at random, five within each stratum. Two surgeons from UEA, with the help of four medical students, were the main drivers of this project.

The logistics of carrying out the hospital visits were facilitated due to support from the Rector of UEA, allowing for protected time and financial support. Nevertheless, collection of data was a logistical challenge, as many remote municipal hospitals in Amazonas are accessible only under certain weather conditions and via long, winding river tributaries or small aircraft. Before arrival on site, the research team would contact the hospital administration to announce their expected date of arrival, the purpose of the visit, what on-the-ground support they would require from local staff, and to demonstrate support from the state Secretary of Health. After arrival, the team would split into two groups. Students implemented the quantitative portion of the SAT via a facility walk-through with an OR nurse or other available staff member able to answer questions about surgical infrastructure. The surgeon simultaneously conducted the open-ended qualitative interviews with the hospital administrator, a surgeon, an obstetrician, an anaesthetist and an OR nurse, pending the existence and availability of those individuals.

The team from UEA's goal was not only to understand the reality of these remote hospitals, but also to compare on-the-ground evaluations of the surgical system with the existing publically available data evaluations. This project has served as a further baseline exercise of the state of Brazil's surgical system and identified meaningful ways that UEA can help improve the quality of surgical care delivered in outlying municipalities. It has also provided the framework for a successful partnership engaging local stakeholders in meaningful research to influence their own regional surgical agenda.



Dr Saurabh Saluja and Dr dos Santos Souza discuss logistics for hospital visits in Amazonas, Brazil

© PGSSC/Julia Amundson

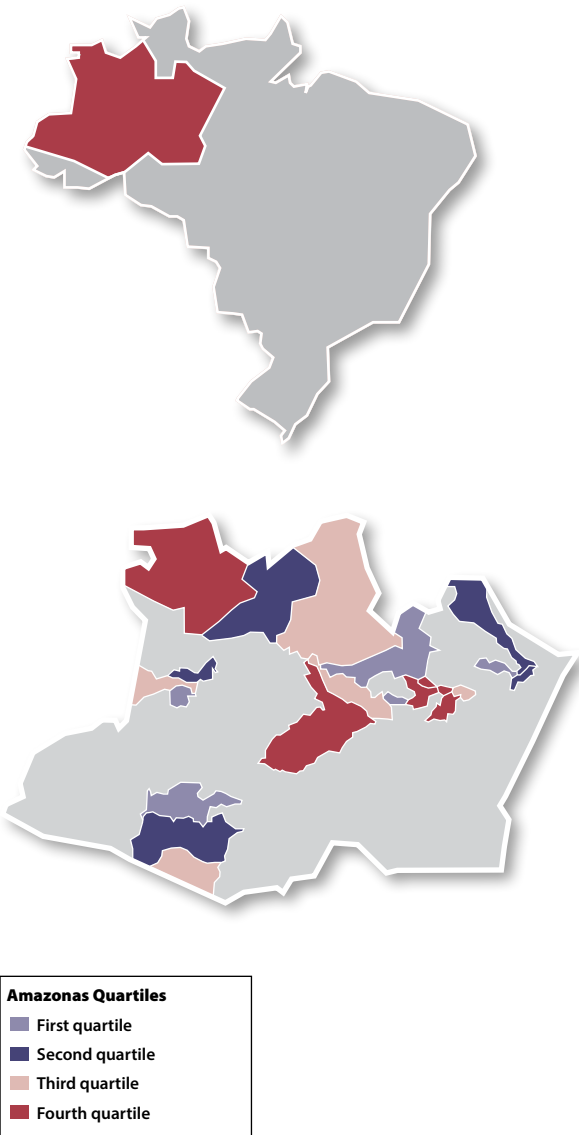
Results

To date, 70% of data collection has been completed in Amazonas within the five domains of infrastructure, workforce, service delivery, financing and information management. Preliminary results show that basic infrastructure such as electricity and internet are lacking, with only 19% of hospitals reporting having electricity available at all times and 56% of hospitals reporting internet connectivity never being available. While some form of anaesthesia is available at 75% of hospitals at all times, lack of workforce poses serious limitations, given that just 25% of hospitals report an anaesthetist being on site at least one day a week.

In spite of this, 63% of hospitals have a surgeon available at least one day a week and 56% of hospitals had been able to perform a caesarean section within the month prior to the site visit, 13% had performed a fracture reduction, and 6% had performed a trauma laparotomy within the same time frame. However, not a single hospital reported dedicated funds from the hospital operating budget for surgical care provision. Due to the nature of Brazil's free-at-point-of-care unified health system, Sistema Único de Saúde, none of the hospitals had patients reporting out-of-pocket expenditure

for their surgical care. All of the information management is carried out via paper charting systems, with 13% of hospitals reporting a mixed system of paper and EMR-based records. (Dos Santos Sousz, UEA, unpublished data, 27 Feb 2017)

Figure 1: Top – map of Brazil with the state of Amazonas highlighted in red. Bottom – map of Amazonas with selected municipalities stratified by population quartile.



Next steps

Following completion of this surgical system capacity assessment, the Brazil team is poised to evaluate the quality of surgical care.

Pará, one of the states in northern Brazil, is home to over 7 million people, with an economy based primarily on mineral extraction, fishing and livestock. The health sector has evolved in the past decade from a centralized system of referral located in the largest city, Belém, into a regionalized system that allows for timely access to high quality health care in five main hospitals located in strategic cities across the state. After meetings with the Secretary of Health and the Chancellor of the Universidade do Estado do Pará, a project was developed to evaluate the quality of surgical care at the hospital level. Differences in care provided at public hospitals under either direct government administration or third-party administration will be assessed. The analysis will be carried out using a novel tool developed by researchers from Harvard Medical School’s Program in Global Surgery and Social Change, including the main variables delineated by the commission and geared specifically for use in low- and middle-income countries.

Key successes

1. Research in the lower-resourced regions of a country is possible through preferential selection of these sites and dedication of the research team.
2. On-the-ground research allows for an in-depth understanding of hospital facilities that goes beyond database analyses. This data can bring perspectives that are crucial to informing public health planning.
3. Team members for successful implementation can include students, professors, administrators, government officials and practitioners. These researchers should have professional time set aside for participating in these projects.

Key lessons learned/challenges

1. Nationally collected data may already be publicly available in several countries and may allow for derivation of the six core indicators. Subnational analysis may reveal crucial disparities.
2. Local partners for data collection and analysis are essential. They must guide the project and share in the value it generates.
3. Arranging logistics for visiting hospitals can be cumbersome, time-consuming and costly, requiring adequate institutional support, protected time, and resources.

References

1. World Bank GDP Ranking Table (<http://data.worldbank.org/data-catalog/GDP-ranking-table>, accessed 1 February 2017)
2. Raykar NP, Yorlets RR, Liu C, Goldman R, Greenberg S, Kotagal M, et al. The How Project: Understanding Contextual Challenges to Global Surgical Care Provision in Low-Resource Settings. *BMJ Glob Health*. 2016;1.4:e000075.
3. Scheffer M, Guilloux A, Matijasevich A, Massenburg BB, Saluja S, Alonso N. The State of the Surgical Workforce in Brazil. *Surgery*. 2017;161(2):556-561.
4. Scheffer, M. Demografia médica no Brasil. Vol 1-3. Conselho Federal de Medicina, São Paulo; 2011-2015.
5. Meara JG, Leather AJM, Hagander L, Alkire BC, Alonso N, Ameh EA, et al. Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development. *Lancet*. 2015;386:569–624.
6. Massenburg B, Saluja S, Jenny H, Raykar NP, Ng-Kamstra J, Guilloux A, et al. Assessing the Brazilian Surgical System with Six Surgical Indicators. *BMJ Global Health*. In Press.

Viet Nam

Authors: Duong Anh Vuong¹, Kristin Hatcher², Barclay Stewart³, Ruben Ayala⁴, Duc Hai Thi Nguyen⁵, Thang Duc Nguyen⁶, Khoa Trong Nguyen⁷, Richard Vander Burg⁸, Khue Ngoc Luong⁹

¹ Head of Hospital Quality Management Division, Medical Service Administration, Ministry of Health, Viet Nam

² Associate Vice President of Strategic Initiatives & Metrics, Operation Smile, Inc.

³ NIH/Fogarty Global Health Fellow, University of Washington; Department of Interdisciplinary Health Sciences

⁴ Senior Vice President of Medical Affairs, Operation Smile, Inc.

⁵ Program Director, Operation Smile Viet Nam

⁶ Expertise of Hospital Quality Management Division, Medical Service Administration, Viet Nam, Ministry of Health

⁷ Deputy Director of Medical Service Administration, Ministry of Health, Viet Nam

⁸ Chief Program Strategist, Operation Smile, Inc.

⁹ Director of Medical Service Administration, Ministry of Health, Viet Nam

Background

Viet Nam is a lower middle-income country with a per capita gross domestic product (GDP) of US\$ 2111 (1). Total health expenditure accounts for 7.1% of GDP (2), which represents an average of US\$ 142 per inhabitant (3). Over the past 20 years, Viet Nam has made significant progress in expanding social health insurance (4), illustrating the Government of Viet Nam's (GoV) commitment to universal health coverage (UHC) for the entire population (4).

In Viet Nam, over 3 million operations are performed annually (approximately one out of every 30 people), which accounts for 11% of all inpatient stays. The cost for one day of surgical treatment is 3.6 times that of non-surgical treatment, equivalent to US\$ 101.72 per day.

Of this, state subsidies average 53% and patients or health insurance companies must pay the remaining 47% (5). The proportion of people participating in health insurance is currently 81%. As a proxy for the availability of essential surgery, the percentage of caesarean sections among live births is 28% (6), which represents adequate coverage of this essential surgical service (7, 8).

Cooperation between Viet Nam MOH and Operation Smile

The Department for Medical Service Administration is a professional management department of the Ministry of Health (MoH). Its function is to consult and assist the Health Minister in managing and organizing the implementation of legal regulations, and issues regarding health examinations, treatments, rehabilitation, medical inspections, forensic examinations, and forensic psychiatric assessments nationwide.

Operation Smile is an international medical charity working in low- and middle-income countries (LMICs), that mobilizes medical volunteers from around the world to deliver free care to individuals born with cleft lip, cleft palate and other facial deformities. Operation Smile works to increase access to safe, well-timed surgery by partnering with ministries of health worldwide and training local medical personnel. Operation Smile has been present in Viet Nam since 1989, engaging more than 200 volunteers and providing surgery to over 25 000 patients since then.

Quality care delivery is a priority for the organization. Therefore, Operation Smile developed Global Standards of Care™ to represent the minimum and absolute requirements for its surgical programmes. Standards of quality are an effective way to decrease variability and establish a minimum level of quality, allowing health systems to achieve goals in patient safety and ensure that appropriate practices are implemented and quality is consistently pursued (9).

Process

The MoH in Viet Nam has identified surgical safety improvement as one of their health priorities. This was a shared area of interest with Operation Smile, so it led to the development and execution of a Memorandum of Understanding in November 2014 that mapped out objectives and partner responsibilities. The goal of the partnership was to equitably increase access to safe, timely and effective surgical care within Viet Nam, by developing and implementing quality standards.

Surgical system audit

To better understand surgical capacity in Viet Nam, a surgical system audit was conducted. Audit tools were collaboratively developed, with technical experts from both the MoH and Operation Smile, which advocated for the inclusion of the patient and provider perspectives, resulting in a more holistic picture of surgery than what would have resulted had either party pursued the audit independently. The audit was comprised of data from three sources: a facility survey, a health worker and patient survey and a “barriers to care” survey. The work done to understand barriers to care was implemented by Operation Smile and a university partner in advance of the audit and assessed issues of access among cleft lip and palate patients. A summary of data related to barriers to care was included alongside data from the facility survey and health worker and patient survey.

Assessment teams were made up of personnel from the Ministry of Health and Operation Smile. The facility survey aimed to assess surgical care capacity at hospitals nationwide, to identify specific strengths and weaknesses in the availability of resources and to inform low-cost, high-yield ways to improve the delivery of safe surgical care. The MoH and Operation Smile developed an assessment tool based on previous



Surgeons operate on a patient with a cleft in Viet Nam

© Operation Smile Viet Nam

assessments of surgical care capacity (10), as well as WHO’s Surgical Safety Checklist and the WHO’s Guidelines for Safe Surgery (10 objectives), and other aspects of safe surgery (e.g., instrument sterilization policies, availability of monitoring equipment after anaesthesia, existence of patient handover protocols, etc.) (11). The tool allowed an assessment of the current state of surgical safety in line with objectives 1, 2, 3, 4, 6, 7 and 9 in the WHO Guidelines for Safe Surgery (Objective 1). The team will operate on the correct patient at the correct site; Objective 2. The team will use methods known to prevent harm from administration of anaesthetics, while protecting the patient from pain; Objective 3. The team will recognize and effectively prepare for life-threatening loss of airway or respiratory function; Objective 4. The team will recognize and effectively prepare for risk of high blood loss; Objective 6. The team will consistently use methods known to minimize the risk of surgical site infection; Objective 7. The team will prevent inadvertent retention of instruments and sponges in surgical wounds; Objective 9. The team will effectively communicate and exchange critical information for the safe conduct of the operation). The tool was adapted to be contextually appropriate for Viet Nam and was designed to be administered in a survey format, including sections on hospital metrics, surgical and anaesthesia workforce, and the availability

of essential resources. Key informants were interviewed using the structured assessment tool on the availability of resources and policies that support safe surgical care.

It is vital that surgical care capacity-building and performance improvement initiatives are designed around the most important stakeholders in surgical care – the patients. To do so, the MoH of Viet Nam and Operation Smile performed a nationwide survey of patients and providers that aimed to: i) assess surgical patient satisfaction in hospitals nationwide; ii) explore provider perceptions of the safety and quality of the surgical care being delivered; and iii) identify ways in which the safety and quality of surgical care could be improved.

Widely validated patient satisfaction surveys specific to surgery in LMICs do not exist (12, 13). Therefore, a patient satisfaction survey was created by combining questions from well-validated and commonly used patient satisfaction surveys in high-income settings, including: the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey; the National Committee for Quality Assurance (NCQA) survey; and the Press Ganey Associates Incorporated survey. Additionally, questions more pertinent to patients in facilities with fewer resources were added (e.g., questions relating to the availability of clean drinking water and adequate hygiene facilities). Patients were also asked to mark specific units (e.g., emergency unit, operating theatre, inpatient ward, toilet facilities) or overarching issues (e.g., provider-patient communication, navigation around the health care system) that they felt needed most improvement in the hospital. A complementary tool was created to broadly query providers regarding their perceptions of the safety and quality of surgical care, and determine the units and overarching issues in the hospital in need of most improvement.

Both tools included a short sociodemographic information section and used a simple Likert scale rating system for measuring satisfaction and perceptions of safety and quality (e.g., 1 – strongly disagree, 2 – disagree, 3 – neutral, 4 – agree, 5 – strongly agree); similar scales have been extensively used in LMICs with good validity, even among people with limited or no education (14, 15). In addition to the questions using the Likert scale rating system, both tools also included open-ended questions, that prompted respondents to discuss other satisfaction, safety and quality concerns, as well as ways in which the concerns might be addressed.

The study was conducted at 36 hospitals representing the socio-economic geographical regions of Viet Nam, including four central hospitals, 20 provincial hospitals and 12 district hospitals. Each hospital was evaluated in a period of one day. The research team consisted of 10-12 people, divided into 3 assessment groups according to the following objectives: Group 1: Conduct an assessment of the current status of infrastructure and Infection control; Group 2: Carry out an assessment on drug and equipment assurance – Supervise the implementation of surgical procedures - Assess the capacity of using the operating room; Group 3: Conduct surveys, consult the patients and family members after surgery.

Analysis of the audit data was jointly undertaken by MoH and Operation Smile. Data analysis represented a continued process of engagement, with several meetings taking place between the two parties to discuss the approach to analysis and interim findings.

Results

The World Health Organization's Guidelines for Safe Surgery represented a relevant framework for assembling the data collected during the audit, in terms of structure and content. The MoH was highly receptive to using these guidelines as a starting point for developing national policy given the credibility of World Health Organization.

A stakeholder meeting was convened to share findings and contextualize the Guidelines for Safe Surgery to Viet Nam and included a diverse group of stakeholders from the MoH and hospitals across the country, as well as international stakeholders from academic institutions and NGOs. Funding for the meeting was provided by Operation Smile. The meeting served as a forum for input and the development of the contextualized guidelines, and resulted in a set of contextualized guidelines for safe surgical care that will be implemented across Viet Nam.

Within each of the guidelines, essential and recommended criteria were defined and policies and procedures that needed to be developed were outlined. This work continues and it is expected that the contextualized guidelines will be ratified by the MoH and included in the national health policy, strategy and plan for surgical care in 2017.

The quality and standardization of infrastructure, equipment, and human resources in providing surgical services within Viet Nam are expected to increase due to the implementation of this policy, although it is unlikely that the effect will be universal.

With the procurement of material and equipment decentralized to the facility level, Viet Nam struggles with national priorities related to critical equipment and infrastructure. Even if all material and equipment defined as necessary by the policy were available, implementation would likely still be challenging. As a result, both partners are committed to developing a pilot hospital where stakeholders could come to observe standards in action and identify possible pathways for implementation in their home hospitals.

Additionally, leadership at the facility level is important, both regarding management of the facility and in surgical health service delivery; these are critical components for improving quality.

Conclusion

The generation of consensus-based guidelines for safe surgery and subsequent adoption of a national surgical care policy represent important steps towards increasing the quality of surgical care in Viet Nam. As demonstrated in Viet Nam, NGOs can play a significant role in supporting the development of national policy on surgery.

Key successes/tips

1. The co-creation of the assessment tools led to joint ownership and a diversity of data points that would not have been obtained had either party undertaken the assessment alone.
2. The process of building consensus is as important as reaching the consensus itself, because of the inclusion and level of engagement it creates.
3. A key role of civil society is leveraging the available resources, both human and financial, to support ministries of health in surgical system strengthening.

Key challenges

1. Implementation: Surgical quality and standardization of infrastructure, equipment, and human resources in providing surgical services within Viet Nam are expected to increase due to the implementation of this policy, although it is unlikely that the effect will be universal.
2. Role modeling: Role modeling is expected to be a necessary component of surgical system strengthening. Immersive experiences into environments where quality standards are consistently applied and mapping pathways for implementation at a facility level are likely to be important.
3. Partnerships: Partnerships between NGOs and ministries of health represent significant opportunities for surgical system strengthening and while this represents an example of success, true collaboration is time-intensive and can be difficult. Trusting relationships are a critical mechanism for navigating these and other challenges.

References

1. The World Bank, World Development Indicators. (2015). GDP per capita current US\$ [Data file]. Retrieved from <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>
2. The World Bank, World Development Indicators. (2014). Health expenditure, total as % of GDP [Data file]. Retrieved from <http://data.worldbank.org/indicator/SH.XPD.TOTL.ZS>
3. The World Bank, World Development Indicators. (2014). Health expenditure per capita current US\$ [Data file]. Retrieved from <http://data.worldbank.org/indicator/SH.XPD.PCAP>
4. Somanathan A, Tandon A, Dao HL, Hurt KL, Fuenzalida-Puelma HL. 2014. Moving toward Universal Coverage of Social Health Insurance in Vietnam: Assessment and Options. Directions in Development. Washington, DC: World Bank.
5. Vuong DA, Flessa S, Marschall P, et al. Determining the impacts of hospital cost-sharing on the uninsured near-poor households in Vietnam. *International Journal for Equity in Health* 2014, 13:40.
6. General Statistics Office and UNICEF, 2015. Viet Nam Multiple Indicator Cluster Survey 2014, Final Report. pp 156-157. Ha Noi, Viet Nam, from http://mics.unicef.org/news_entries/21.
7. Appropriate technology for birth. *Lancet*. 1985;2(8452):436-7.
8. World Health Organization, UNFPA, UNICEF, & AMDD. (2009). Monitoring Emergency Obstetric Care: A Handbook. (pp 35). Retrieved March 20, 2017, from http://www.unfpa.org/sites/default/files/pub-pdf/obstetric_monitoring.pdf.
9. A Standards-driven Approach to Improve the Quality of Health-care Services for Adolescents. Issue brief no. 15.06. World Health Organization, n.d. Web. http://apps.who.int/iris/bitstream/10665/184035/1/WHO_FWC_MCA_15.06_eng.pdf
10. Carlson LC, Lin JA, Ameh EA, Mulwafu W, Donkor P, Derbew M, et al. Moving from Data Collection to Application: A Systematic Literature Review of Surgical Capacity Assessments and their Applications. *World journal of surgery*. 2015;39:813-21.
11. Haynes AB, Weiser TG, Berry WR, Lipsitz SR, Breizat AH, Dellinger EP, et al. A surgical safety checklist to reduce morbidity and mortality in a global population. *The New England journal of medicine*. 2009;360:491-9.
12. Onwujekwe A, Etiaba E, Oche A. Patient satisfaction with health care services: a case study of the federal medical centre Makurdi, north central Nigeria. *International Journal of Medicine and Health Development*. 2013;18.
13. Bernhart MH, Wiadnyana IG, Wihardjo H, Pohan I. Patient satisfaction in developing countries. *Social science & medicine*. 1999;48:989-96.
14. Gopichandran V, Wouters E, Chetlapalli SK. Development and validation of a socioculturally competent trust in physician scale for a developing country setting. *BMJ open*. 2015;5:e007305.
15. Sheferaw ED, Mengesha TZ, Wase SB. Development of a tool to measure women's perception of respectful maternity care in public health facilities. *BMC pregnancy and childbirth*. 2016;16:67.

Part 3 - National planning

Defining the problem

For surgical systems to develop as needed, they must be recognized as a crucial part of universal health coverage and a fully functioning health system. To accomplish this, a purposeful and concerted effort must come from all relevant stakeholders within the country, including the ministry of health, professional societies, individual health care providers, as well as private and non-state sectors. Within this context, countries must engage in a national surgical, obstetric and anaesthesia planning process. Ideally, the national surgical, obstetric and anaesthesia plan (NSOAP) should be fully embedded within the overall national health policy, strategy or plan (NHPS), with appropriate resources targeted for surgical care. Furthermore, national surgical, obstetric and anaesthesia forums can be used to ensure transparency and as a way of exchanging ideas and engaging providers.

The template of a NSOAP should include the following domains (Annex 4):

1. Infrastructure
2. Service delivery
3. Workforce
4. Financing
5. Information management
6. Leadership and governance.

Process components

1

Committee development

Stakeholders need to be fully engaged in the process of developing a NSOAP. The health ministry and WHO country office should coordinate committee meetings to define the baseline status of the surgical system and to develop consensus on the most important priorities necessary to move surgical care forward in the country. Committees should include groups from different backgrounds to gain important alternative perspectives. These can include, but are not limited to public health professionals, surgical, obstetric and anaesthetic providers, nursing staff and ministry of health representatives. These committee members should meet regularly to define the priorities of the NSOAP within the country.

2

Discussion Framework

To aid in discussions during committee meetings, clear terms of reference are highly recommended. A discussion framework which covers all the domains of a NSOAP (infrastructure, service delivery, workforce, information management, financing, and leadership and governance), can be found in Annex 5. Countries should develop and expand this framework to match their setting and requirements.

3

Integration into current health strategy

The goal of committee meetings is to develop a NSOAP designed to then be integrated into the NHPSP for that country. This will ensure that the policy is relevant, easily adopted, and implemented.

4

National surgical, obstetric and anaesthesia forums

National surgical, obstetric and anaesthesia forums are important to engage all relevant stakeholders, including potential funders who may support the plan. These forums provide an avenue for each stakeholder to voice their individual opinions and concerns throughout the process, increasing transparency, buy-in and accountability.

5

Costing

The NSOAP must be costed by the ministry of health to facilitate budgeting and prioritization. Furthermore, this costing will encourage further advocacy and funding efforts. This is especially important in lower income countries, where a significant percentage of health plans are financed with the assistance of external partners.

6

Monitoring and evaluation plan

The NSOAP must include a robust monitoring and evaluation plan. Goals and targets must be tracked consistently to ensure that the plan is effective in increasing quality surgical care for all patients, and that the overall health and economic prosperity of the population is improving. This plan should be combined with the indicator and facility assessment sections as described in prior sections of this monograph.

Case studies



Republic of Zambia

The Zambian Ministry of Health was the first to implement WHA resolution 68.15 by drafting a health policy specific to surgery in the country. The process included committee working groups that met weekly to discuss priorities, followed by a writing workshop to draft the plan, and a costing workshop to propose a budget for the plan.



Federal Democratic Republic of Ethiopia

Ethiopia has created a country-wide surgical improvement programme, named SaLTS, Saving Lives Through Surgery.



Republic of India

In India, efforts are being championed by the Association of Rural Surgeons of India. This grassroots-led initiative is in contrast with other government-led efforts.

Zambia

Authors: Emmanuel Makasa¹, Kennedy Lishimpi², Yihan Lin³, Swagoto Mukhopadhyay³

¹ Counsellor-Health: Permanent Mission of the Republic Zambia to the UN at Geneva and Vienna, Embassy of the Republic of Zambia to Switzerland, Geneva, Switzerland

² Director Cancer Control, Consultant Clinical Oncologist & Paediatrician, Ministry of Health, Zambia

³ Global Surgery Research Fellow, Program in Global Surgery and Social Change, Harvard Medical School, USA

Background

In 2010, the Zambian Ministry of Health performed an audit to evaluate the progress of achieving the Maternal and Child health related Millennium Development Goals (MDGs). This audit of emergency obstetric and newborn care revealed that despite significant investments and improvements in many health indicators, the trends suggested that the MDG targets for neonatal and maternal mortality would not be met by 2015. Therefore, the MOH put together a task force to identify the root cause of this gap. This investigation revealed that the primary obstacle for achieving these targets was a lack of surgical services at the district hospital facility (particularly caesarean sections). Furthermore, a country-wide study to assess the baseline status of the emergency and essential surgical and anaesthesia care revealed many gaps, and, among them, 74% of Zambians do not have access to timely, safe, and affordable surgical care.

In 2015, the Zambian delegation co-sponsored and led the negotiations that culminated in the adoption of Resolution 68.15 at the 68th World Health Assembly (WHA). This resolution was a political commitment by Member States

to prioritize investments in emergency and essential surgical and anaesthesia care as a part of universal health coverage (UHC), and a way of strengthening primary health care. Recognizing current gaps in infrastructure, workforce, service delivery, finance, information management, leadership and governance, the Zambian Ministry of Health embarked on implementation of resolution 68.15 by developing a National Surgical, Obstetric and Anaesthesia Strategic Plan (NSOASP) in the country at the beginning of 2016. The goal was to create a NSOASP to be integrated into the National Health Sector Strategic Plan of Zambia, 2017-2021.

Process

Zambia's national planning efforts emphasized a provider-driven process, with oversight by the Ministry of Health. The Program in Global Surgery and Social Change (PGSSC) at Harvard Medical School was identified as a key partner to facilitate these efforts. This process was termed the National Surgical, Obstetric, and Anaesthesia Plan, and composed of the following phases:

1. Baseline assessment and information gathering
2. Working group with Committee Meetings
3. Writing Workshop
4. National Surgical Forum
5. Costing Workshop
6. Official signing and dissemination and launch

The initial phase consisted of thorough baseline surgical services assessment. All published literature on surgery, as well as unpublished ministry of health reports, were identified and compiled. Over a 6-month period, the PGSSC team abstracted all data from these reports and compiled them based on the national surgical,

obstetric and anaesthesia plan template (Annex 3). This information formed the basis of the next phase of working group committee meetings.

To define the surgical priorities in the country, committee meetings were held weekly over a period of 3 months. Broad engagement was emphasized for these meetings, and committee members included all relevant stakeholders – among them surgeons, obstetricians, anaesthetists, non-physician providers, ministry of health personnel, professional organizations, academic institutions, policy makers and non-governmental organizations. Members of the working group were divided into three main committee groups addressing the issues facing the domains of infrastructure and service delivery, workforce, and financing and information management in Zambia. During each 2-hour meeting, predetermined terms of reference based upon the earlier baseline assessment guided the meetings.

After these meetings, each committee drafted the priorities for surgical care scale up in their domain. A one week writing workshop followed, where the Zambian NSOASP was drafted. Of note, the NSOASP was written with the goal of integration into the country's overall 5-year National Health Strategic Plan for 2017-2021. Therefore, a 5-year plan was written for the NSOASP, with yearly and mid-term goals and targets.

To ensure transparency and to ensure all voices were heard, a National Surgical Forum was held to discuss the plan and its main priorities with stakeholders at large.

The final step was to cost out the NSOASP. A one week costing workshop was convened and each item on the NSOASP was costed. Wherever possible, information from prior efforts were used as a template for the cost.



Photos: Top - Panel at the Zambian National Surgical, Obstetric, and Anaesthesia Forum. Bottom - Attendees of the Zambia NSOASP Writing Workshop.

© PGSSC

Results

The NSOASP has been written and costed, with plans to integrate within Zambia's National Health Strategic Plan for 2017-2021. The NSOASP includes a roadmap with concrete milestones plus monitoring and evaluation mechanisms for surgical scale up in the critical domains of a surgical system, including infrastructure, workforce, service delivery, financing, and information management.

Next steps

After the plan is signed, the next step is wide dissemination of the document followed by implementation of the plan. This will be done through engagement of funding bodies and implementing organizations in partnership with the Ministry of Health, so as to ensure adequate financial support for this plan and an expedient implementation strategy.

Key successes/tips

1. Government/Ministry leadership is critical in developing a plan that will be applicable for the country. Ownership from the ministry should be emphasized at the beginning of the process.
2. The NSOASP must be anchored within the overall country's national health strategic plan, in order for implementation to be integrated and sustainable.
3. Engaging partners for financial and technical support for the initial planning phases is important to ensure that the process is accomplished.
4. The role of local champions to keep everything on course should not be underestimated.
5. An all-inclusive process with all stakeholders for buy-in from the initial stage is essential.

Key challenges

1. The NSOASP requires a commitment of local providers, often without monetary compensation. Therefore, it is important to engage a key local champion to ensure that the process does not get stalled.
2. Drafting the NSOASP is a reiterative process requiring consensus from multiple stakeholders; therefore it is important to always allocate additional time for this process.
3. Ministry leadership can be fluid; therefore, it is important that key players are engaged throughout the entire process to ensure continuity.
4. As this is the first time any nation is developing such a plan, there were no other such plans that could be used for lessons on "best practice".

Ethiopia

Authors: Kesetebirhan Admasu¹, Daniel Burssa², Abebe Bekele³, Andualem Beyene⁴, Kaya Garringer⁵, Atlibachew Teshome⁶, Abraham Endeshaw⁷

¹ Former Minister of Health, Federal Ministry of Health, Ethiopia

² Chief of Staff, State Minister's office, Federal Ministry of Health, Ethiopia

³ Associate Professor of Surgery, Addis Ababa University, Senior Advisor - SaLTS Initiative, Federal Ministry of Health, Ethiopia

⁴ Associate Professor of Surgery, Addis Ababa University, School of Medicine, Department of Surgery, Ethiopia

⁵ Research Assistant, Program in Global Surgery and Social Change, Harvard Medical School, USA

⁶ Focal person - SaLTS Initiative, Health Services Quality Directorate, Federal Ministry of Health, Ethiopia

⁷ Former Director of Medical Services, Federal Ministry of Health, Ethiopia

Background

Over 100 million people live in Ethiopia, with many receiving health services through a three-tiered, public health system (1,2). Over the past two decades, the Ethiopian Federal Ministry of Health (FMOH) has sought to improve its health system by implementing four strategic Health Sector Development Plans (HSDP). Prior to 2014, objectives including maternal, newborn and child health, nutrition, and infectious disease, were often the focus of health policy in Ethiopia. The fifth and current strategic plan, the Health Sector Transformation Plan (HSTP), emphasizes an agenda for change specific to essential and emergency surgical and anaesthesia care (3). In line with the HSTP, the National Health Care Quality Strategy was launched in 2015 and included surgical services among its five priority intervention areas.

By implementing the HSTP, Ethiopia has made an unprecedented move, among low-income countries, to prioritize surgical system reform in the national health agenda. Preceding the World Health Assembly resolution 68.15 on emergency and essential surgical and anaesthesia care in May 2015, the lack of surgical services, workforce and infrastructure in Ethiopia had been identified as an issue of importance by the FMOH (4). Although it is estimated that over five million surgical interventions are needed in Ethiopia each year to adequately serve the needs of the population, other estimates show that no more than 200 000 surgeries (4%) are actually performed annually (1). Patients seeking surgical care in Ethiopia may experience waiting times as long as one or two years, especially at referral hospitals. The lack of access to quality care is further exacerbated by a shortage of qualified surgical and anaesthesia providers. As of July 2016, the surgical workforce was comprised of 1524 professionals including 277 general surgeons, 44 orthopaedic surgeons, 190 dental surgeons, 174 obstetric-gynaecologists, 91 ophthalmologists, 287 integrated emergency surgical officers, 57 anaesthetists, and 594 BSc.- or MSc.-level anaesthetists and Level 5 or advanced diploma certified anaesthetists (2, 5). Currently, Ethiopia remains far from meeting the goal of 20 SAO providers per 100 000 population recommended by the Lancet Commission on Global Surgery (6). Additional issues such as poor infrastructure, a weak management system for the supply chain of surgical equipment and consumables, limited coordination and leadership of surgical services, and lack of data and monitoring and evaluation also inhibit the provision of safe, affordable and quality surgical care.

To address these challenges and respond to the WHA resolution, the Ethiopian FMOH has developed and begun implementation of

the *Saving Lives through Safe Surgery* (SaLTS) initiative, a national surgical planning effort that aims to improve equitable access to safe and quality surgical and anaesthesia care in facilities across all levels of the health system.

Process

Development of a national initiative

The recommendations made at the 68th WHA provided the impetus for the national surgical planning process in Ethiopia. The concept was first introduced in 2015 by a former Minister of Health of Ethiopia, Dr Kaseteberhan Admasu. Discussions were initiated with FMOH officials, local surgeons, the Surgical Society of Ethiopia and the WHO Country Office Ethiopia that facilitated the drafting of a concept note which would serve as a basis for the SaLTS initiative.

Figure 1: SaLTS Initiative in Ethiopia



An expert working group of key individuals and organizations involved in surgery and anaesthesia was organized and tasked with drafting a strategic document for the development of a national surgical system in Ethiopia. Over a period of 5-6 months in the spring of 2015, this group met regularly to draft the initiative. Progress was continually reported to an executive leadership committee that included most of the leadership of the FMOH.

Early engagement with both local and international stakeholders successfully attracted support for the plan and its objectives. The FMOH met with potential stakeholders

including the GE Foundation and organizations involved in the SafeSurgery 2020 initiative, the American College of Surgeons (ACS), the College of Surgeons of East, Central and Southern Africa (COSECSA), the Surgical Society of Ethiopia (SSE), the Anaesthesia Society of Ethiopia, the Ethiopian Association of Anaesthetists (EAA), and the Ethiopian Society of Obstetrics and Gynaecologists (ESOG). Many of these meetings secured important partnerships for the new initiative. Stakeholder coordination and involvement was emphasized during the planning process, as they were regularly consulted by the Ministry committee and working group for insight, feedback and revisions as the plan began to take shape.

By late 2015, the first draft of a strategic document for the initiative in surgery and anaesthesia had been completed and approved by the Council of the Directorate (a FMOH management committee led by the Minister). The draft introduced a five-year plan to improve “access, quality and equity” of surgical care and anaesthesia and enable health facilities throughout Ethiopia to consistently deliver 76 key emergency and essential procedures in a surgical package defined by the expert working group (2). The plan was organized around eight pillars of excellence intended to guide the development and implementation of a national surgical, obstetric and anaesthesia care system: leadership and management, infrastructure, pharmaceuticals, human resource development, advocacy and partnership, innovations, quality of surgical and anaesthesia care service delivery, and monitoring and evaluation. A comprehensive budget and financing strategy was developed in addition to the strategic document, as the FMOH had been actively working to secure financial support for the plan from both the Government and stakeholders, as well as from more innovative sources such as unspent funds originally allocated to meeting the United Nations’ Sustainable Development Goals (SDGs).

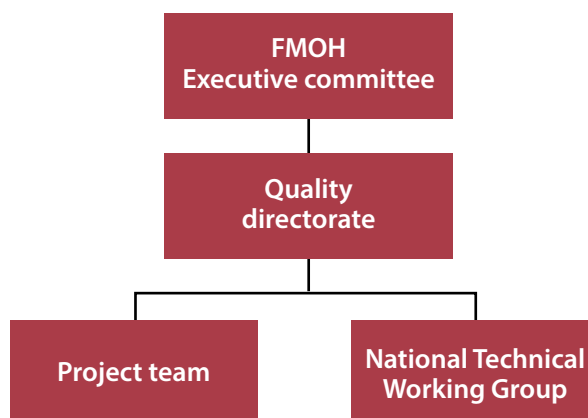
The plan, which is now known as the SaLTS initiative, was introduced to governmental, clinical and academic health institutions, representing all nine regions of Ethiopia, during the Annual Review Meeting of the Ethiopian Ministry of Health, in December 2015.

Management structure

National implementation of the SaLTS initiative is managed by three entities: a technical working group, project management team within the Health Services Quality Directorate of the FMOH, and an executive committee (2). The National Technical Working Group is responsible for organizing and initiating various activities and programmes within the SaLTS initiative. Among other responsibilities, the group has worked to finalize the strategic document, guidelines and tools needed to implement SaLTS, lead training sessions for regional health bureaux, and conduct monitoring and evaluation activities (2). Professionals from the Ministry and many stakeholder organizations and societies are involved in the activities of this group.

The Technical Working Group provides direct support and assistance for the project management team, located within the Health Services Quality Directorate of the FMOH that develops plans and oversees implementation. This team operates under the Executive Committee which provides high-level direction for all parts of the initiative. Members of this committee ensure that the emergency and essential surgical package is successfully implemented through the SaLTS initiative, determine the budget and provide approval for plans developed by the technical working group and management team. This management structure was developed with the intention of replicating it at all levels of the health system; to ensure that implementation of SaLTS successfully reaches across the whole of Ethiopia.

Figure 2: SaLTS Management Structure



Results

Many objectives within each of the eight intervention pillars of SaLTS have already been accomplished, including:

- completion of a five-year national strategic document for SaLTS;
- development of a national management system (see above) and formation of leadership teams at regional and facility levels;
- national SaLTS training in all regions and facilities throughout Ethiopia;
- successful launch of surgical team leadership and mentorship programmes in Tigray and Amhara Regions, in partnership with the GE Foundation SafeSurgery 2020 initiative, with programming currently being expanded to other regions;
- allocation of FMOH budget for a two-phase plan to construct 370 new operating theatre blocks nationally - eighty blocks are so far complete and construction has begun on the remaining 290 blocks;
- procurement of operation theatre equipment valued at US\$ 50 million with plans to distribute to facilities in all regions currently underway;

- development of a General Surgery Human Resources National Roadmap (approved), an Anaesthesia Human Resources National Roadmap (waiting for approval) and a National Essential Anaesthesia Equipment and Supplies Roadmap (waiting on approval);
- organization of the International Safe Surgery Conference for 2018 in collaboration with the African Union, COSECSA and Pan-African Academy of Christian Surgeons (PAACS), along with other advocacy events and publications;
- development and approval of a National Essential Surgical Procedures list;
- national implementation of the WHO Surgical Safety Checklist;
- implementation of an innovative oxygen delivery system at selected facilities and anticipated construction of new oxygen plants;
- creation of a monitoring and evaluation plan, necessary tools, and training modules so that all surgical facilities can be trained in monitoring and evaluation of SaLTS within a year;
- completion of a regional availability and surgical workforce needs assessment;
- launch of a comprehensive institutional assessment of all surgical facilities.

The challenges and successes experienced in Ethiopia during development of the SaLTS initiative provide valuable insights for other countries interested in developing a similar national surgical plan. Perhaps most importantly, the continuous, high-level commitment from Ministry of Health officials

has been fundamental to the success of a national initiative such as SaLTS. Through the leadership of a 'Safe Surgery Champion', the initiative was able to quickly gain momentum in the early stages of development, and the unrelenting involvement of many other members of the SaLTS management team have meant that the plan managed to endure recent institutional turnover which threatened to disrupt its progress. Significant investments in time and resources are needed from all levels of government and among stakeholders during this sort of process. Ethiopia prioritized the role of partners during the development process but intends to turn over implementation and management to regional health bureaux in an effort to increase engagement in lower levels of government.

Next steps

After nearly two years of planning and development, Ethiopia has initiated implementation of SaLTS and will soon become one of the first low-income countries to make a national commitment to safer, more accessible and affordable surgical and anaesthesia care. The success of the initiative demonstrates that the development of a national surgical plan is similarly achievable in other low- and middle-income countries.

Key successes/tips

1. Establish strong leadership and continued commitment within Ministry of Health.
2. Create social mobilization around an initiative to increase general awareness of current issues and garner national support for surgical system reform.
3. Prioritize active collaboration with partners and stakeholders throughout the development process, as many can offer expertise, guidance and additional funding.

Key challenges

1. Maintaining momentum throughout the planning process.
2. Lack of uniformity among regions during the implementation phase.
3. Forming key partnerships and attracting investments from local and international stakeholders.

References

1. United Nations Statistics Division. Ethiopia: country profile. 2017. <http://data.un.org/CountryProfile.aspx?crName=ethiopia>
2. Federal Ministry of Health of Ethiopia. National Five Years Safe Surgery Strategic Document, 2016-2020. 2016. Document in preparation.
3. Federal Ministry of Health of Ethiopia [2016]. Health Sector Transformation Plan 2015/16 2019/20. 2016.
4. Resolution WHA68.15. Surgical Care Strengthening. In: Sixty-eighth World Health Assembly, Geneva, 18–26 May 2015. Resolutions and decisions, annexes. Geneva: World Health Organization; 2015:2 (WHA64/2015/REC/1).
5. Federal Ministry of Health of Ethiopia. Statistics on Human Resources for Health in Ethiopia. 2016.
6. Meara JG, Leather AJM, Hagander L, Alkire BC, Alonso N, Ameh EA, et al. Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development. *Lancet*. 2015;386:569–624.

India

Authors: Brian Till¹, Saurabh Saluja², Nakul Raykar², Siddarth David³, Nandakumar Menon⁴, Gita Mody⁵, Jesudian Gnanaraj⁶, Salim Afshar⁵, Nobhojit Roy⁷

¹ Research Associate, Program in Global Surgery and Social Change, Harvard Medical School, USA

² Global Surgery Research Fellow, Program in Global Surgery and Social Change, Harvard Medical School, USA

³ Senior Research Officer, Tata Institute of Social Sciences (TISS), India

⁴ Medical Director, Association for Health Welfare in the Nilgiris (ASHWINI) Hospital, India

⁵ Research Faculty, Program in Global Surgery and Social Change, Harvard Medical School, USA

⁶ Medical Director, Samiti for Education, Environment, Social and Health Action (SEESHA) Hospital, Karunya University, India

⁷ Chief of Surgery, Bhabha Atomic Research Centre Hospital, India

Background

Meeting the surgical imperative in India, with its 29 states and 1.3 billion people, presents a uniquely daunting challenge. The health care system is comprised of a patchwork of public and private institutions, and overall government spending on health care is exceedingly low, hovering close to 1% of GDP. As much as 75% of the population lacks access to any form of health insurance (1) and it is estimated that each year, 39 million people are pushed into poverty due to catastrophic health expenditure (2). Of those, 30 million live in rural settings, where more than 90% of the population lacks access to safe, timely and affordable surgical care (3). In addition to this significant rural-urban divide, there are also substantial regional differences in health and access to health care. Life expectancy varies dramatically by state, ranging from 56 in Madyha Pradesh to 74 in the southern state of Kerala. Access to public health facilities also

varies greatly. There are 1.67 hospital beds per 1000 people in the state of Arunachal Pradesh, compared 0.11 per 1000 people in Bihar (4). India also faces a severe shortfall of health care workers. The total number of allopathic doctors, nurses and midwives is less than half of the WHO-recommend benchmark (11.9 per 10 000 people vs. 24.5 per 10 000 people) (5). In rural government facilities, some 84% of surgical positions and 77% of obstetrics and gynaecology positions remain unfilled (6). Although surgical deficits strain all LMIC economies, the scale of deficits in India and the country's incredible size compound these costs. Economic losses due to surgically treatable disease are projected to total \$1.7 trillion over the next 15 years, roughly equivalent to 1.5% of GDP (3).

Process

Development of a single, national level plan is both impractical and likely impossible for a country as large and regionally complex as India, where health policy is generally set at the state level. National surgical planning has instead taken the form of grassroots driven efforts.

Since the start of the Lancet Commission on Global Surgery (LCoGS) process, the Association of Rural Surgeons of India (ARSI) has been a key partner in tackling the challenges with surgical care delivery to the underserved in India.

In December 2015, ARSI committed their annual meeting to the development of a consensus statement identifying key areas of focus for the rural surgical agenda. ASRI, with a membership of more than 3,000 rural surgeons, has worked relentlessly to increase access to surgical care for India's rural poor for more than 25 years. The working group at the 2015 annual meeting was comprised of 50 surgeons from geographically diverse settings. Working through a three-day, iterative process, the group drafted and

approved the Karad Consensus Statement. The document identifies three key domains of work and corresponding action items: (1) Workforce improvements; (2) increasing blood product safety and availability; and (3) attention to issues of surgical need and innovation particular to rural settings.

The first Indian National Surgical Forum was convened in Delhi in March 2016, with WHO headquarters, Regional Office and Country representatives attending. The meeting brought together stakeholders from the national government, private industry, nongovernmental groups and various medical professional societies. Discussions centred on the scope of the surgical burden of disease in India and created space for discussion about the challenges and gaps in the provision of care. A broad range of ideas and commitments were developed by participants.

Results

Several key outcomes emerged from these two forums. First, to better coordinate and support grassroots efforts, stakeholders formed a central secretariat based in Mumbai. The group was launched in July 2016 and has taken the name “Implementing the Lancet Commission on Global Surgery in India” (iLCoGS-India). iLCoGS-India plans to facilitate the development of collaborations and networks, bringing together those that best understand existing shortfalls and those in positions to (1) study them, and (2) advocate for potential solutions. As of late 2016, iLCoGS-India had also opened a field office in Delhi to facilitate national level advocacy when and where appropriate.

To this end, iLCoGS-India has established relationships with six collaborative centres:

1. The Centre of Excellence in Healthcare Leadership & Motivation (Maharashtra)
2. The Centre of Excellence in Advocacy on Improving Surgical Workforce (Maharashtra)
3. The Centre of Excellence in Advocacy on Low-cost Surgical Interventions (Maharashtra)
4. The Centre of Excellence in Surgical Training (Tamil Nadu)
5. The Centre of Excellence in Appropriate Low-Resource Surgery (Jammu & Kashmir)
6. The Centre of Excellence in Surgical Innovation (Tamil Nadu).

Second, leveraging the structure and relationships described above, significant progress has been made on each of the domains outlined by the Karad Consensus. On issues related to workforce shortages, the Centre of Excellence in Surgical Training has led a group of collaborators in the design and validation of a curriculum focused on task-sharing related to the safe provision of anaesthesia care. Regarding access to blood products, stakeholders have aligned the key professional societies to endorse legal changes to allow the use of unbanked direct blood transfusions (UDBT) in rural settings. Cosignatories include the Indian Association of Paediatric Surgeons, the Federation of Obstetricians and Gynaecologists of India, the Indian Orthopaedic Association, the Association of Rural Surgeons, and the Indian Society of Anaesthesiologists. There is ongoing work to map the scale of this blood drought. In the final domain, iLCoGS-India has partnered with Karunya University to develop a Centre of Excellence in Surgical Innovation. Research on more than half a dozen projects is currently under way, including several aimed at making safe laparoscopic surgery accessible to the rural poor.

Third, the decision has been taken that baseline assessment of surgical capacity, facility assessments and planning should occur at the state level, with efforts to be led by surgeons

from the respective states. iLCoGS-India plans to play an advisory role in this process, facilitating logistics and trainings required for the implementation of such assessments. iLCoGS-India is currently supporting two such efforts.

Next steps

There are several specific ways this group hopes to push forward. First, collaborators will continue to work to elevate government and public understanding of surgical deficits and their economic impact. This will require direct engagement with public officials and continued efforts to better inform the public. iLCoGS-India's advocacy office in Delhi and ARSI's network of dedicated surgeons across the country are well positioned to undertake such efforts. Second, recognizing the scale of the urban-rural health care disparity, collaborators will maintain a focus on advancing each

domain of the rural surgical agenda identified by the Karad Consensus. Specifically, work will be undertaken at both the state and national level to study the extent of blood deficits and to advocate for improved access to safe, timely and affordable transfusion. Third, iLCoGS-India will continue to enlist surgical leaders who are well positioned to lead baseline assessments and facility assessments in each of the 29 states. This data will provide a powerful advocacy tool for the network described above to use as it works to further engage public officials in the months and years ahead.



© PGSSC/Brian Till

Photo: iLCoGS-India staff and surgical champion awardees at the annual meeting of the Association of Rural Surgeons of India (ARSI), November 2016, Kullu, India

Key successes/tips

1. Engaging a broad set of stakeholders early in the process is instrumental for: identifying the most important domains of work; fostering ownership and commitment from those working at the grassroots level; and making policy-makers and industry aware of the scale of surgical deficits and associated costs.
2. In larger countries and countries with significant regional autonomy, the value of advocacy by surgeons at the local and state levels should not be overlooked as part of a more comprehensive strategy. To be effective, such work often requires coordination and consistent, effective communication from an organizing group.
3. Recognition from the national level and international organizations, including WHO, can greatly legitimize and enhance the size and type of audience that is receptive to existing messages put forward by those best versed in surgical deficits at the local level.

Key challenges

1. Building consensus around a shared agenda with disparate actors can be highly challenging. It requires frank, open dialogue, often spread over a considerable length of time. This agenda must be durable and significantly robust, yet also adaptable over months to years, as the movement grows and evolves. Similar efforts would be well-served to undertake priority-setting iterative processes.
2. The disparate nature of a grassroots movement is at once a great strength and a source of potential tension and weakness. To ensure legitimacy, it is imperative to keep track of efforts being undertaken by affiliated people and groups and to ensure that the work and the manner in which it is undertaken aligns with overall objectives.
3. To maintain enthusiasm, it is crucial to be in regular communication with those at the grassroots level, regardless of their level of involvement. Such communication means that successes in one area of focus or region can inspire and inform work in others. It can thus create virtuous circles and spur collaborations that might otherwise be missed.

References

1. Forgia LG, Nagpal S. Government-sponsored health insurance in India: Are you covered? World Bank Feature story, 2012.
2. Balarajan Y, Selvaraj S, Subramanian SV. Health care and equity in India. *Lancet*. 2011;377(9764):505-515.
3. Alkire BC, Raykar NP, Shrima MG, Weiser TG, Bickler SW, Rose JA, et al. Global access to surgical care: a modelling study. *Lancet Glob Health*. 2015;3(6):e316-23.
4. National Health Profile 2015. Central Bureau of Health Intelligence, Directorate General of Health Services, Ministry of Health and Family Welfare India
5. Rao M, Rao KD, Kumar AK, Chatterjee M, Sundaraman T. Human resources for health in India. *Lancet*. 2011;377(9765):587-598.
6. Bulletin on rural health statistics 2014-2015. Government of India, Ministry of Health and Family Welfare Statistics Division.

Summary and way forward

This publication aims to provide a flexible roadmap for surgical, obstetric and anaesthesia service delivery planning at the national level, through a stepwise progression of indicator collection, hospital assessments, stakeholders' forums and the development of a national plan. However, our case studies emphasize that this roadmap can be modified and moulded, since each process is unique. In fact, to ensure feasibility of implementation, this guide should be adapted to the local context, resources, and data availability. As countries move forward in developing NSOAPs, we summarize the roles that the various stakeholders can play in this process.

Local

Providers and professional societies

Key pillars of NSOAPs are the health care workers on the ground. Ultimately, these are the individuals directly involved in service delivery. Therefore, having strong local engagement is critical. Additionally, professional societies such as surgical, obstetric, anaesthesia and nursing associations are natural champions for these efforts to ensure the success and longevity of a national plan.

National

Ministries and Member States

In most cases, initial interest and leadership started with on-the-ground clinicians and other providers. Nevertheless, ministry of health involvement is critical and should be engaged as early in this process as possible. This ensures that surgery is prioritized as a part of an integrated approach to health care delivery. Ministries must ensure that data collection is done accurately and consistently, and must use this to lead national policy-making, budgeting and implementation. There are cases where ministry involvement early on is not possible. However, there are ways to mitigate this challenge, however, as demonstrated in the examples of India and Brazil, where other forms of leadership can lead to successful engagement and results.

Regional

Surgical societies and regional organizations

Regional efforts around NSOAPs should be coordinated between ministries, professional societies, and other governing bodies. This leads to important benchmarking, as well as an exchange of ideas and resources. Surgical societies must also advocate together to

influence their respective ministries to address the need for surgical care. We have seen examples of the Royal Australasian College of Surgeons (RACS) as well as the College of Surgeons of East, Central and Southern Africa (COSECA) influencing ministries of health to prioritize surgical planning in their countries.

International

World Health Organization

There must be an effort by the global community to improve surgical care and anaesthesia in the long-neglected surgical system. The World Health Organization must be able to continue its efforts well beyond the mandates of resolution WHA 68.15. It must facilitate global and regional efforts through partnerships, WHO collaborating centres dedicated to surgical care and anaesthesia, and through non-state actors in official relations with WHO. Yet, WHO must continue to focus on assisting at the country level. WHO country and regional offices can provide technical expertise, facilitate local partnerships and work closely with ministries of health, which can use local resources such as networks and supply chains.

WHO has the critical role of encouraging countries to submit their data to the WHO SAT website. The information on the surgical world development indicators can then be sent to the World Bank for further analysis and comparison between countries and regions.

World Bank

The World Bank serves as a critical organization to ensure data collection of the surgical care indicators are analysed and publicly available. It is important to ensure that the WDI website continues to include surgical care, and must eventually adopt the remaining indicators of 2 hour access as well as perioperative mortality rate.

Partner organizations

Partnerships must be developed between various synergistic organizations, including but not limited to the private sector, non-state actors, not-for-profit entities, donor organizations, foundations and industry. These partner organizations are key players in providing technical support, human resources, local networks and funding. Narrow vertical funding for specific surgical niches are not the answer for the future. Funders have to step up and fund large scale surgical capacity building projects, and not just focus on one surgical intervention at a time. Without a more holistic approach to national surgical scale up, these smaller vertical projects are left without a proper foundation in a broader properly functioning surgical care ecosystem.

Funding organizations

Foundation funders, industry and governments that fund global health must recognize surgery for what it is - a true partner in health care delivery, education, and research. Surgery is an "indivisible, indispensable part of health care." Safe caesarean sections, like any surgical procedure, require a properly functioning surgical ecosystem. These organizations are encouraged to fund projects that promote integrating surgical, obstetric and anaesthesia care into strengthening health systems at a national and regional scale.

National surgical, obstetric and anaesthesia planning is rapidly gaining momentum worldwide, as countries witness the health, social and economic benefits that strengthened surgical systems provide. Surgical and health strengthening efforts must be measurable, transparent, and locally-driven for this process to succeed. We must bring all relevant stakeholders along in this process, and continue to advocate for the five billion people around the world who deserve access to quality and affordable surgical, obstetric and anaesthesia care.

Annexes

1: The Six Core Surgical Care Indicators

Six core indicators have been suggested to evaluate the preparedness, service delivery, and financing of a surgical system.

<http://www.lancetglobalsurgery.org/indicators>
<http://www.lancetglobalsurgery.org/implementation-tools>
<http://www.who.int/healthinfo/indicators/2015/en/>

2: Surgical Assessment Tool (SAT)

The Surgical Assessment Tool is designed as a hospital walkthrough tool to evaluate the strength of a surgical system within 5 domains: infrastructure, service delivery, workforce, information management, and financing.

<http://www.who.int/surgery/publications/s15986e.pdf>
<http://www.lancetglobalsurgery.org/implementation-tools>

3: Qualitative Interview Tool

The semi-structured interview is a qualitative tool designed to understand the key factors affecting the provision of safe, affordable and timely surgical care. This should be done in conjunction with the SAT.

<http://www.lancetglobalsurgery.org/implementation-tools>

4: National Surgical, Obstetric and Anaesthesia Plan Template

The NSOAP Template contains the most critical components of a resilient surgical system.

<http://www.lancetglobalsurgery.org/implementation-tools>

5: Discussion Framework

Discussion frameworks are available in each NSOAP planning domain to facilitate productive discussions amongst stakeholders that ultimately provide the foundation for a NSOAP.

<http://www.lancetglobalsurgery.org/implementation-tools>

SURGICAL CARE SYSTEMS STRENGTHENING

Developing national surgical, obstetric and anaesthesia plans

Emergency and Essential Surgical Care Programme

Service Delivery and Safety Department
World Health Organization
20 Avenue Appia
1211 Geneva 27
Switzerland
Please visit us at: www.who.int/surgery
Please contact us at: surgery@who.int

Program in Global Surgery and Social Change

Harvard Medical School
641 Huntington Avenue
Boston, MA 02115
USA
Please visit us at: www.pgssc.org
Please contact us at: pgscboston@gmail.com

ISBN 978 92 4 151224 4

