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# GLOBAL SURGERY

## CONTENT



# GLOBAL SURGERY: GEARING UP INTO THE NEXT DECADE

A cold wave in the week of the 8th of February put the Netherlands under a blanket of snow. During this single week, more than 40,000 people presented to the Dutch emergency departments after a fall on the ice. Many of these traumatic injuries, most of them fractures, were treated with plaster, but a considerable number needed surgery. After these surgical or non-surgical treatments, patients will get regular check-ups and paramedical care (e.g. physiotherapy) to ensure the fastest and best possible recovery.

The presence of such a functioning surgical system with ambulance services, an emergency department, a staffed and stocked operating theatre including anaesthesia services, radiological diagnostic tools, and trained paramedics etc. is considered a normality by many. However, in a large number of countries – especially low- and middle-income countries – these systems have not yet been sufficiently developed.[1] In the case of traumatic injuries such as above, a surgical health system is absolutely indispensable. It is however just one example of why a surgical health system is of vital importance. It is also important for many non-communicable (e.g. cancer, cardiovascular diseases) and communicable (e.g. typhoid fever, pelvic inflammatory disease, mycetoma) diseases.[2]

The 2015 recognition of surgery as a fundamental and unequivocal part of universal health coverage – so that all individuals and communities receive the health services they need without suffering financial hardship – has been an important driver for the further development of surgical care systems. Many multilateral organisations, development finance institutions, (inter)regional institutions and smaller organisations have since made efforts to scale up timely, safe and affordable surgical services across continents and hemispheres.[3]

A surgical health system is like a mechanical watch: a complex system of multiple larger and smaller interconnected parts, working together, yet all with their own function and individually pivotal for ultimate performance. Similarly, global surgery is a multidisciplinary field with separate fields and subfields sharing a common goal: to provide improved and equitable surgical care across health systems worldwide. As a result, interdependent progress in the development of surgical systems is complex and takes more time than, for example, the development of so-called single disease programmes. Yet it also offers opportunities: developing the separate elements such as ambulance services, anaesthesia and patient monitoring services will also be beneficial in the treatment of non-surgical diseases through their interdisciplinary applicability.

The foundations of global surgery have been laid. This edition of MT*b* on global surgery reflects on this and also looks forward. The importance of developing surgical health systems is described in a review of its role in cancer care. We discuss the importance of anaesthesia services. There are examples of task-sharing and training programmes as well as reflections on the intentions of surgical missions, the role of mentorship in training programmes, and research-based strengthening of health systems. We hope you enjoy your read and invite you to share your thoughts on one of our social media channels.

**Remco van Egmond**

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# Global surgery: access to basic surgical care is a joint responsibility

Lack of appropriate surgical care in many parts of the world has long been severely neglected. In the 1980s, Dr Mahler, at that time secretary general of the World Health Organization (WHO), stated that "surgery clearly has an important role to play in primary health care and in services supporting it". Yet there is an undeniable discrepancy in surgical care and services between high-income countries (HICs) and low- and middle-income countries (LMICs), which hasn't improved much over all those years. In 2015, still only 3.5% of the total estimated volume of surgery done worldwide was done for the poorest one third of the world population.[1] Meanwhile, hospitals in HICs have developed significantly over the past decades, from surgeons using a knife and stitches to hospitals packed with scanners, minimally invasive procedures, robotics, electric devices, distance control and technology driven highly specialised and sophisticated procedures, guided by well controlled quality systems. When one takes a single step in a rural or district hospital in any LMIC, the difference will immediately be felt.

## PRIORITIES FROM A GLOBAL PERSPECTIVE

Can we alter inequalities in accessing quality surgical care, reflected in huge differences in outcome for any given surgical condition, despite forty years of discussions, meetings, assistance, cooperation, declarations, missions, training programmes, research, advocacy and so forth?

Conditions needing surgical care contribute significantly to the global burden of disease. Internationally up to 5 billion people cannot get timely and affordable proper surgical care when they are in need of it (Figure 1), and the need for surgical services is expected to rise until 2030. The first global reports on surgery were released and reported in 2013-2015: an estimated 16.9 million lives were lost (33% of all deaths worldwide) due to conditions needing surgical care, which was more than the total number of deaths from HIV, tuberculosis and malaria combined. The burden of untreated surgical conditions is highest in LMICs.[1] So to gain substation improvements in access to surgical care, we need a global strategy and joint effort. Investing in improvement of surgical care services is affordable and cost-effective.[2]

Yet from a health-economics perspective we are failing to realise this. The WHO calculated that of the US$ 8.3 trillion that was spent annually on health in 2018, more than 75% was spent in Europe and the Americas, while Southeast Asia and the Eastern Mediterranean regions each accounted for 2%, and the African region for 1%.[3]

In 2012, 88 LMICs* – together representing more than 70% of the world population – had still not reached targeted surgical volumes. If the historical scale-up rate of 5.1% of surgical services is continued, only 39 of those 88 (44%) will achieve the 2030 target, and GDP losses due to surgical conditions will largely overcome the total costs of its effect.[1]

Considering the need, it is worthwhile debating whether the gap in health care investment and expenditure is ethically justifiable.

## GLOBAL SURGERY

Global surgery has been defined as "an area of study, research, practice, and advocacy that seeks to improve health outcomes and achieve health equity for all people who require surgical care, with a special emphasis on underserved populations and populations in crisis".[4] It encompasses all kind of surgical interventions for common disorders such as hernias, acute abdomen disorders, and tumours. Moreover, surgery plays a vital role in cancer treatment. In most LMICs, prognosis of cancer is poor due to late presentation, scarcity of early diagnostic facilities, and lack of one or more of the multidisciplinary actors in oncology care, radiotherapy, chemotherapy and surgery.[5] Furthermore, many deformities and disabilities, either congenital or acquired, can still be found untreated in LMICs (e.g. cleft lip, clubfoot, cataract, contractures after burns and obstetric fistulas).

Basic surgical interventions can be divided into 'must do', 'should do', and 'can do' (Figure 2). The first category (must do) includes laparotomy, caesarean section and treatment of an open fracture. The second category (should do) includes among others hernia repair, cholecystectomy and evacuation of intracranial hematoma. The final category (can do) includes many surgical diagnoses such as cataract, prostatectomy, and vesicovaginal fistula, and is usually not urgent.

The big challenge is how to assure providing timely, high-quality must do and should do surgical interventions for any person worldwide, ideally within two hours of presentation. Despite many efforts, a considerable number of hospitals in LMICs are still not in the position to provide these treatment modalities for the most urgent surgical conditions, mainly due to a lack of well-trained staff and/or appropriate equipment.

## TRAUMA AND INJURY

Injury is within the top 10 causes of death in LIMCs.[6] It is a major cause of temporary and permanent disability, leading to long-term absence from daily activities and loss of income. More than 90% of the injury deaths occur in LMICs. Road traffic injuries (RTIs) are responsible for the highest number of disability adjusted life years (DALYs)**, compared to all other diseases within

the age group between 10-49 years, and this has been unchanged since the 1990s.[6] We are in a global trauma pandemic, and it is estimated that the incidence of injury and RTIs will increase due to increased mobility associated with economic development (Text box).

In the systematic approach to injury and trauma, surgery is an integral part of the trauma care system. Surgically trained professionals are responsible for the primary survey and resuscitation in the emergency room and the definitive clinical management (both operative and non-operative) of trauma patients as well as the follow-up of patients.

Next to general prevention measures and better prehospital care, surgeons and anaesthetists, together with other stakeholders (e.g. rehabilitation centres, physiotherapists etc.) in trauma care, are key actors in improving these statistics.

Considering injury is a major cause of mortality and morbidity, especially in LMICs, what can be done to address this problem?

In general, a systemic approach to trauma care, adapted to local context, is needed. Countries should include the development of a trauma system in their national surgical plans. For these trauma systems to be effective, training programmes should focus on making qualified surgical and anaesthesia staff available, 7 days a week and 24 hours a day, in all corners of the world. Although the Advanced Trauma Life Support (ATLS) system is the gold standard for reducing mortality in the first hours after the accident, it seems unlikely to be affordable for most LMICs, especially in rural areas. The more Adapted Primary Trauma Care (PTC) programme, provided free of charge, is a very good alternative, with the same surgical principles. The PTC is fully endorsed by the WHO and other partners.[7]

Also, it is recommended to train general duty doctors and clinical officers to perform basic trauma care (burns, fractures, soft tissue injuries), particularly in countries where specialist treatment is not readily available.[8] This means that trauma programmes should primarily be aimed at transferring skills and knowledge to health professionals, giving them the authority and trust to perform lifesaving interventions.

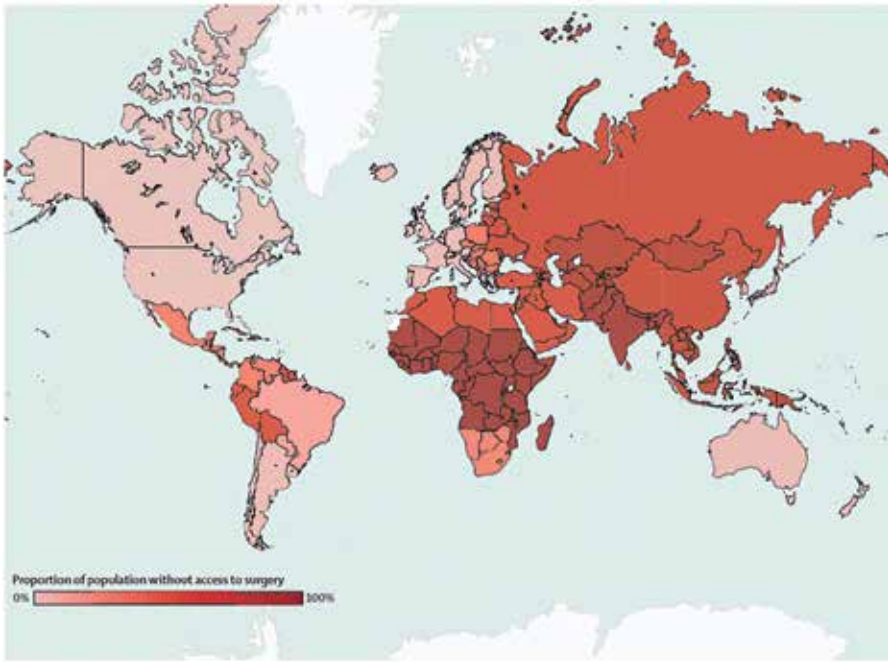



*Figure 1. Proportion of the population without access to safe, affordable surgery and anaesthesia. Access here is more than simply surgical capacity: it also includes affordability (without suffering catastrophic health expenditure), safety and timeliness of care.*[1]

When it comes to preventing disability, most disabling fractures can be operated on in a systematic way, aiming to restore function and movement and so facilitating a quick return to daily life. Although in HICs these interventions for preventing disabilities are done by highly specialised (orthopaedic) surgeons, it has been shown that the use of standardised appropriate technology and methods can lead to similar results (and at lower costs) in low-resource settings.[9] Inclusion of relevant data on every operated patient in a global database, together with feedback and follow-up mechanisms, will ensure appropriate quality control as shown in the SIGN fracture care programme.[10,11]

## IS THERE REASON FOR OPTIMISM?

There is no 'one fits all' solution, and all too often 'solutions' were invented by motivated but biased surgeons from HICs. Equality between

**Must do**
Acute, high-value procedures that need consistency through local structures; and less complex, urgent procedures that can be delivered through these same structures.

Acute, high-value procedures include
- Laparotomy
- Caesarean delivery
- Treatment of open fracture

Lesser complex, urgent procedures include
- Wound debridement
- Dilation and currettage
- Closed fracture reduction

**Should do**
High-priority, high-volume procedures for planned surgery at the first-level hospital.

Lower-risk procedures include
- Hernia repair
- Contracture release
- Superficial soft tissue tumour resection
- Gastroscopy

Medium-risk procedures include
- Cholecystectomy
- Intracranial haematoma evacuation
- Thyroidectomy
- Mastectomy

**Can do**
Important procedures potentially needing specialist support. Ideally, higher-risk procedures should be done at tertiary centres, or done at first-level hospitals with the assistance of visiting super-specialist teams.

Examples include
- Thoracic surgery
- Transurethral resection of prostate
- Uretero-renoscopy
- Vesicovaginal fistula
- Basic skin flaps
- Rectal prolapse repair
- Cataract
- Cleft lip and palate repair

*Figure 2. Common surgical procedures stratified in a must do, should do, and can do framework for first-level care. The chart could be adapted to local context.*[1]

the parties involved was formally written down, but in practice not always felt by local stakeholders.

The (renewed) introduction of equality in international partnerships and global surgery research can be seen as a step in the right direction. With the Global Initiative for Emergency and Essential Surgical Care (GIEESC), the WHO has introduced an international platform where partners in global surgery can meet. As a result, related programmes are developed and organised at a local level and embedded in national plans - such as the national surgical obstetric and anaesthesia plan (NSOAP) - which are based on the understanding that local communities are best positioned to assess where the real needs are, including which areas to fund.

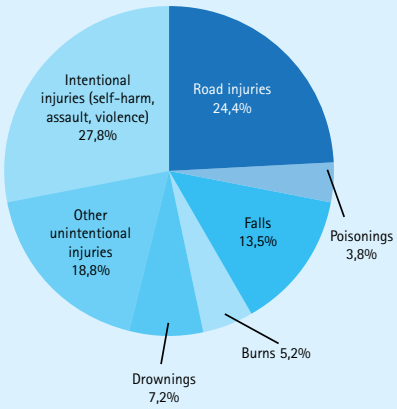
In my opinion, we need to fundamentally reshape our thinking about the nature of funding universal access to basic surgical care, in the same way that public health programmes are funded such as HIV, vaccinations, and mother and child care programmes.

It is not about donations or charity from rich to poor countries; it is our joint responsibility to provide all financing needed to ensure a certain level of basic surgical care around the world. The most straightforward way would be to allocate appropriate resources through the WHO to finance NSOAPs of LMICs. We must do so to save millions of lives. Hope can be derived not only from the *WHA Resolution 68.15 Strengthening emergency and essential surgical and anaesthesia care is a component of universal health coverage* which was unanimously adopted at the World Health Assembly in 2015 and can be seen as an universal commitment. Hope can also be derived from more recent declarations by world leaders at the latest World Health Summit on connecting global health programmes with climate change and the United Nations sustainable development goals.[12]

In conclusion, lack of essential surgical care should not be seen as a local problem but rather as a collaborative international responsibility to achieve global equality in surgical care by all means including training, sustainable technology, cooperation and funding. Only then will the goal of reducing surgical deaths have a chance of becoming reality.

**TEXT BOX: FACTS AND FIGURES OF INJURY AND TRAUMA**[13]

- 1.35 million people die each year as a result of Road Traffic Injuries.
- 93% of these fatalities occur in the LMICs, even though they have only 60% of the world's vehicles.
- About 73% of all RTIs occur among young males.




*Proportions of injury categories in global mortality of all injuries, 2012.*[14]

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Humanitarian, war and rural surgery

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**To our knowledge these are the most recent data on worldwide target surgical volumes.*

***Disability adjusted life years (DALYs) is a measure of overall disease burden, expressed as the number of years lost due to ill-health, disability or early death.*

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# Cancer and the potential of oncological surgery in Sub-Saharan Africa

Cancer is the second leading cause of death globally and responsible for 9.6 million deaths in 2018. The majority of these deaths, a staggering 70%, occur in low- and middle-income countries (LMICs).[1] The total cancer burden is currently mainly dominant in high-income countries, which have an incidence rate of generally 2- to 3-fold higher than in LMICs. However, LMICs are quickly closing this gap. Africa for instance, is expected to have a 70% increase of newly diagnosed cancers by 2030.[2,3]
Surgery plays a vital role in the treatment of cancer. Since the establishment of the Lancet Commission on Global Surgery in 2013, more attention has been focused on improving the development and delivery of surgical and anaesthesia care in LMICs. However, surgical care for cancer is still lagging far behind, as it has not received sufficient attention in cancer control discussions, especially in Sub-Saharan Africa (SSA).[4]
This paper aims to give a brief overview of the burden of cancer, the development of cancer services, and the role of surgery in SSA for patients with an oncological diagnosis.

## THE EPIDEMIOLOGY OF CANCER IN SUB-SAHARAN AFRICA

The GLOBOCAN database shows an estimated 1.1 million new cancer cases and about 700,000 deaths in 2020 in Africa.[5] These numbers may look surmountable compared to other continents, but it is only an estimate. As most health systems in African countries are not developed for cancer surveillance, the actual burden is likely to be higher, and with ongoing urbanisation and associated lifestyle changes it is even likely that the total increase might be greater than the expected 70% between 2012 and 2030.[6] This has mainly to do with the demographic transition which changes the population composition – expected increased life-expectancy in LMICs – and the prevalence of risk factors for cancer: people in societies in social and economic transition are more frequently exposed to risk factors linked to cancer such as smoking, obesity and alcohol consumption.[7]

It is bad to have cancer, but even worse to have cancer in Africa. The case fatality rate for cancers in Africa is 65% compared to 44% in a developed continent such as Europe, and almost all of those deaths occur at a young age.[3,7] Leading factors causing this are the absence of prevention and screening, late diagnosis, and subsequent suboptimal treatment.

The most common types of cancers diagnosed and responsible for cancer mortality in Africa, especially in SSA, differ quite markedly from the rest of the world. For example, for women, cervical cancer is the most commonly diagnosed cancer in SSA compared to breast cancer in the rest of the world. In men, lung cancer is the leading cause of death in most countries, although in SSA it is more heterogeneously divided between prostate, liver (still common despite hepatitis B vaccination), oesophagus cancer, and Kaposi's sarcoma (Figure 1, 2).[3]

Between countries within SSA, the incidence rates of different types of cancer varies considerably, which has to do with aetiological factors: the environment – e.g., climatic, dietary and microbiological (e.g. schistosomiasis for bladder cancer and *Helicobacter pylori* for gastric cancer) factors - and genetics. It is likely that the incidence of cancers within those countries and the change in future are due to the demographic transition previously referred to.[8]

## HEALTH SYSTEMS RESPONSIVE TO CANCER DETECTION AND TREATMENT

Prevention and screening strategies are the first principles of cancer control, whether in high- or low-income countries. These strategies are usually described in National Cancer Control Plans (NCCPs). The World Health Organization has formulated the most relevant for LMICs – tobacco control interventions, hepatitis B vaccination, human papillomavirus vaccination, and screening of precancerous cervical lesions – which are very cost-effective (slightly depending on the context).
For the treatment of cancers, the most cost-effective are early-stage cervical cancer screening, treatment of early breast cancer, and highly curable childhood cancers (acute lymphoid leukaemia, Burkitt's lymphoma, Wilms' tumour, and retinoblastoma).[2] Palliative care is part of the essential package of cancer care as well.

However, the current availability of cancer screening and treatment services in LIMCs is poor. A recent literature review summarised the evidence on resources for cancer care in Africa.[9] A comprehensive list of all cancer treatment facilities contained 102 institutions, of which 38 were in South Africa. For radiotherapy services, it showed that 70% of the 277 radiotherapy machines in Africa are located in Egypt and South Africa. Twenty-nine countries had none. The availability of chemotherapy is low, and the price of such agents was 2.7-6.1 times the international reference price. Few health care workers are even trained to administer them. Technical and financial barriers prevent the widespread availability of radiotherapy machines and chemotherapeutics which are essential modalities for haematological cancers in particular.

## THE ROLE OF SURGERY IN CANCER CARE

Surgery is fundamental in all aspects of cancer care including biopsies for diagnosis, resections for treatment, and procedures for palliation.[10] In the treatment of the cancers most prevalent in SSA, surgery has the potential to play a key role. In more advanced settings, surgery is important in combination

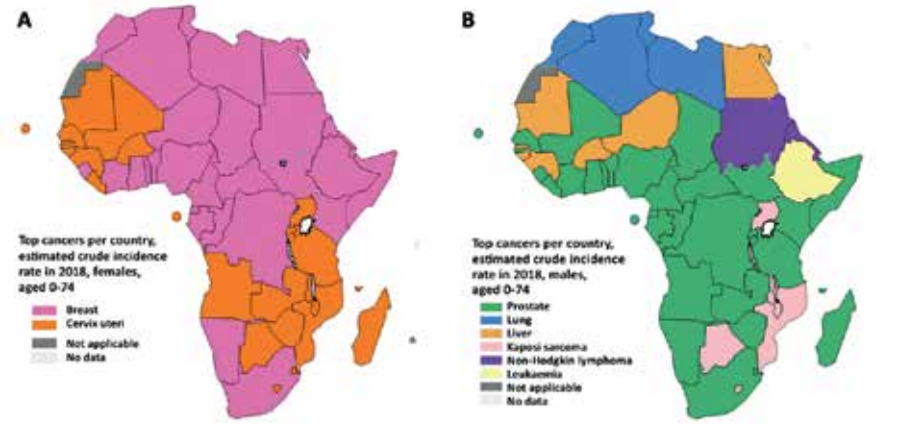


*Figure 1. The most common cancer by country for women (A) and men (B).*[3]

with radiotherapy and chemotherapy – e.g. breast conserving surgery with radiation. But in areas lacking radio- or chemotherapy, many cancers can be treated safely with relatively basic surgery and require only basic surgical instruments. For example, the modified radical mastectomy is still an appropriate treatment of local and regional disease in early-stage breast cancer. The operation is also technically not difficult and can be taught quite easily.[11] For cervical cancer, surgical treatment of stage I is usually curative.[12] Surgery is especially effective and also less complex and expensive when performed in early stage. Hence surgical cancer services should concomitantly be developed with services for early detection – especially in SSA where currently most patients present with advanced stages of disease. This sounds complex, but an example of basic, cost-effective requirements for cancer care that should be available throughout the levels of the delivery platform can been found in Table 1. Obviously, the delivery of surgical cancer services should coexist with other platforms delivering health services. For instance, the development of laboratory, pathology, and imaging services can synergistically improve a broader cluster of health services and make it more cost-effective.[2]

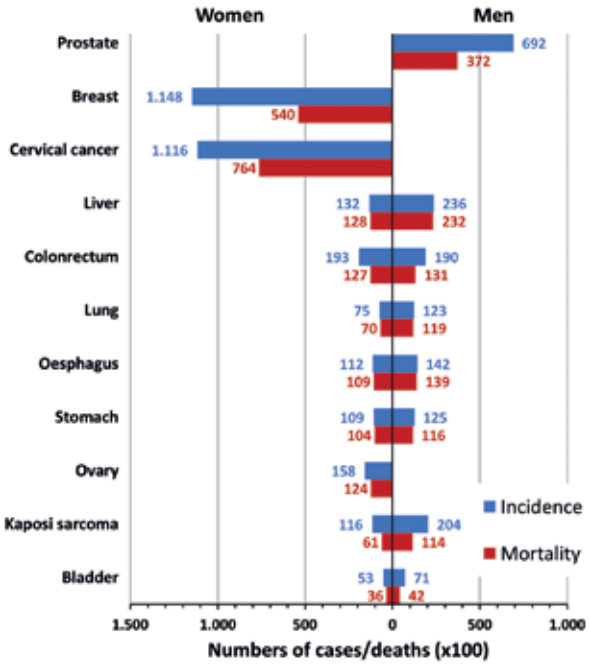


*Figure 2. The cumulative incidence and mortality of cancers in Sub-Saharan Africa in 2018 in persons in the ages 0-74 by sex.*[6]

Surgery plays a smaller role in advanced stages of cancer in LIMCs, but may still provide improved quality of life and add to palliative care. For example, a palliative colostomy in malignant bowel obstruction can improve quality of life in a palliative setting.[2]

## LONG TERM CANCER CONTROL PLANS ARE NEEDED

Currently a total of twelve countries (24%) in SSA have an NCCP.[13] An NCCP is crucial in the development of cancer services in LMICs and comprehensively defines the purpose of planned activity, the content of interventions, and the resources to execute the plan. As such, it provides guidance for infrastructure and human resource development. An NCCP should preferably be developed within a wider public sector strategy, adapted to local epidemiology and context, based on local data and evidence.[14] Such data can best be provided by national population-based cancer registries, but at the moment too few of these exist in Africa. The African Cancer Registry Network uses 31 registries in 22 countries, but only a few of these are national registries.

Next, governments are called upon to significantly put energy and time into oncological training and education. Surgical oncology requires a specific knowledge base and way of thinking, as well as training to develop particular surgical skills. Basic programmes could be set up for (non-physician) clinicians – e.g. clinical officers – which can be supported with distance consultation during clinical practice. More advanced programmes are suitable for registrars and specialists.[15] They should be adapted to the local context and ideally be embedded in existing training programmes. The College of Surgeons East, Central, and Southern Africa (COSECSA), for example, has embedded surgical oncology in the FCS (Fellowship of the College of Surgeons) general surgery curriculum.

## CONCLUSION

The burden of oncologic disease is an emergent challenge for Sub-Saharan Africa. Oncologic surgery plays a key role in the multidisciplinary

**Table 1. A suggested platform for the delivery of Surgical Cancer Care.**[2]

| Community health centre | First-level hospital (district) | Second-level hospital (regional) | Third-level hospital (tertiary) |
|---|---|---|---|
| • community health centre or small rural health hospital<br>• may have a small no. of inpatient and maternity beds<br>• capable of performing minor surgery under local anaesthesia<br>• paramedical staff, nurses, midwives<br>• visiting doctors | • district- or provincial-hospital, with 50-300 beds<br>• adequately equipped major and minor operating theatres<br>• trained nonphysician or medical officer anaesthetists<br>• district medical officers in surgery, senior clinical officers in surgery, nurses, midwives<br>• +/- resident general surgeon and/or obstetrician-gynaecologist<br>• visiting specialists | • referral-hospital of 200-800 beds<br>• well-equipped major and minor operating theatres<br>• supported by imaging, laboratory, and blood bank services, as well as basic ICU facilities<br>• general surgeons, obstetricians-gynaecologists<br>• anaesthesiologists<br>• +/- specialist surgeons | • referral-hospital of 300-1,500 beds<br>• well-equipped major and minor operating theatres<br>• advanced imaging, laboratory services<br>• ICU facilities<br>• highly specialized staff and technical equipment<br>• clinical services highly differentiated by function<br>• often have teaching activities |

approach of prevention, diagnosis and treatment. National cancer control plans are the essential frameworks to improve cancer care. Training and education programmes should be an integral part of this.



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# Surgical missions in current days: exploring their intentions and outcomes

## A perspective from the research platform Global Surgery Amsterdam

For decades, international non-governmental organisations (iNGOs) have organised short-term surgical missions in low- and middle-income countries (LMICs). Traditionally, these missions provide surgical care for patients in need, provided by volunteer surgeons from high-income countries (HICs) who travel to LMICs for a set period, from a few days up to several weeks. Although such missions are common, they are increasingly becoming the subject of debate in global health literature. Lack of follow-up and outcome measurements has resulted in limited evidence on the impact of such missions. Recent voices have been critical on the ethical implications of such missions, even referring to them as expressions of neo-colonialism, and pointing to circumstances in which the idea to do good may well have an undermining effect on the local healthcare system.
In this article, we seek to explore insights into current criticism of the traditional model of surgical missions. We believe that in a world with 5 billion people lacking access to safe and affordable surgical care, there is a place for the international surgical community to support surgical care in LMICs.[1] However, a collaborative and therefore more sustainable strategy is needed with local actors in the lead.

### CURRENT VIEW ON SURGICAL MISSIONS

After the 2015 World Health Assembly resolution recognising surgical care and anaesthesia as indispensable components of universal health coverage, the overarching multidisciplinary field of global surgery emerged to address equitable surgical care across international healthcare systems.[1-3] Recognition of this specialty led to increased public attention, which also meant that international surgical activities performed under the global surgery flag gradually became the subject of social and ethical debate. As surgical missions are perhaps one of the most common examples of promoting access to surgical care worldwide, these activities have also come under scrutiny.

Over the past year, the debate on surgical missions to LMICs intensified alongside the rise of the Black Lives Matter movement and acknowledgment of institutional racism – also within our medical world. Questions were raised whether medical institutions truly reflect society and to what extent activities in LMICs, which are initiated by organisations from HICs, perpetuate neo-colonial narratives.[5-7] Recently on Devex – an online media platform for the global development community – Ameh et al. stated in their article that global surgery is at a crossroads as surgical missions ultimately disempower the very communities they are created to help by undermining the local providers and local infrastructure and displacing the existing healthcare providers'.[7] A publication by Scheiner et al. (May 2020) sent a similar message in their discussion on the pros and cons of surgical missions in the global surgery debate. While surgical missions can result in benefits for local hosts and HIC volunteers, they also run the risk of becoming the "bold new face of colonialism" in LMICs.[6]

Neo-colonialism is used by Ahmed et al. and Scheiner et al. to describe the use of economic, political, cultural, or other pressures by HICs to control or influence LMICs. In global surgery, this might manifest as HICs assuming that LMICs suffer from health problems only economically advanced nations know how to solve.[5-8] While both authors use this term, it would be short-sighted to immediately stop all missions as they also have large potential benefits. In throwing out the baby with the bathwater, you miss the opportunity to strengthen functioning health and surgical systems.

### RECENT PUBLICATIONS BY GLOBAL SURGERY AMSTERDAM RESEARCHERS

Publications on methods to quantify the effects of surgical missions are still scarce. In addition to the ethical debate on surgical missions, researchers from Global Surgery Amsterdam (GSA) showed the need to improve strategies of surgical missions from a medical point of view. A literature review by Hendriks et al. showed that little was known about how surgical missions were organised. Information about the purpose, structure, effectiveness, and result of the mission was also often lacking.[4] Following this publication, Botman et al. performed a survey among 61 members of visiting surgical teams to collect information on current practices and possible improvements.[9] A quarter of the respondents stated that there was no collaboration with local actors at all. However, the majority (94.9%) expressed a strong need to develop sustainable partnerships within local healthcare systems as a collaborative way to improve surgical care in LMICs. Training the local staff was considered to be the most important activity during a mission.

### TANZANIAN PERSPECTIVE ON SURGICAL MISSIONS

Dr Grayson Mtui, a surgical colleague and medical doctor from Tanzania currently working at Haydom Lutheran Hospital provides insight into how surgical missions can become a sustainable practice. In an interview, he emphasised how missions can be helpful in building the capacity of the local surgical healthcare system and what conditions should be met. To ensure an exchange of knowledge between all parties involved,

Dr Mtui emphasises that the local team has to be involved in every step of the mission, including preparations, patient screening, operations, and follow-up. He explained that in order for surgical missions to be beneficial, they also need to include anaesthesia services and training activities for local healthcare workers. He further emphasised that training local healthcare workers to use locally available supplies increases the capacity and autonomy of local healthcare systems. "In Haydom, we started to work together with the visiting doctors instead of being dependent on them. For example, local doctors are now able to perform cleft lip surgery, which would not have been possible without visiting surgeons". He also insists on jointly developing long-term plans to ensure that missions are a collaborative effort.

His observations are in line with the advice of Ameh et al. and Scheiner et al. and the thoughts of GSA in regard to placing the focus on training of local teams striving for sustainable and equal partnerships. Some NGOs have already shifted to bilateral partnerships as a way forward.[6,7,10] One such partnership is the Smile Train initiative in which surgeons in LMICs are trained by international teams from HICs in performing cleft lip and palate repair techniques. The result has been an increase in both volume and quality of cleft care in the countries where the initiative is active.[11]

## THE PROPOSED STRATEGY OF GLOBAL SURGERY AMSTERDAM

Through extensive experience in the field of global surgery, GSA has developed five key focus areas for developing sustainable partnerships in global surgery missions.

1. Local ownership: work with a local partner that has ownership of the problem and feels the responsibility to meet the goals set by both partners.

2. Bilateral knowledge transfer: teaching is the main activity for visiting surgeons. Use the opportunity to build capacity and provide local healthcare workers with bedside and classroom trainings.

3. Research: perform research to assess the local need and to evaluate the impact of activities. When performing surgery with the local team, analyse and evaluate surgical outcomes and complication rates and adjust programme planning accordingly.

4. Internet technology: increased internet connectivity allows for stronger communication between the local team, members of the surgical mission, and colleagues in referral hospitals. This can decrease professional isolation of the rural surgical team and ease the referral of patients when needed.

5. Collaboration: surgical expertise is just one of the elements that are important to improve surgical care. Always strive to collaborate intensively with partners who have additional expertise that may be required, e.g. public health specialists, economists or organisational experts. Last but not least, building successful sustainable partnerships also requires an understanding of local social and cultural norms as well as the power dynamic between LMICs and HICs.

## PROSPECTS

Increasing access to safe and affordable surgical care for 5 billion people is an urgent call to which we encourage surgeons and anaesthetists from HICs to respond. However, as medical doctors with experience in the field of global health, we believe that the traditional short-term surgical mission model is not a sustainable solution. When the (ethical) implications of working as a visitor in a foreign healthcare system are overlooked, it can lead to the disempowerment of local healthcare workers and the communities they are trying to help. Therefore, we encourage building equal and sustainable partnerships that foster bilateral knowledge exchange in support of – not parallel to – the local healthcare system. Future partnerships should include post-surgical care outcome research and strengthening the surgical capacity of local healthcare systems to counterbalance the underrepresentation of local stakeholders in surgical programmes and research. If we want to make a sustainable impact on the equity of surgical care worldwide, all the voices involved must be heard.



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# Scaling up the surgical workforce in Malawi: an interview with Prof. Eric Borgstein

Eric Borgstein serves as professor of surgery at the University of Malawi College of Medicine and simultaneously as a consultant in paediatric surgery at the Queen Elizabeth Central Hospital in Blantyre, Malawi. During his career, he has played an essential role in the expansion of local surgical capacity by setting up training programmes for medical students and non-physician clinicians or clinical officers (COs) in Malawi as well as for surgical specialty qualifications. He currently functions as secretary general of the College of Surgeons of East, Central and Southern Africa (COSECSA). MT*b* spoke with him on the implementation of the CO surgical training and two related surgical projects in Malawi (COST-Africa and SURG-Africa), aiming for the implementation of surgical systems. We also discussed the surgical specialty training through COSECSA.

## DEVELOPMENT OF CLINICAL OFFICERS IN MALAWI

"Historically in Malawi, CO training started even before the establishment of the medical school in 1991. Before that time, in the 70s-80s, most district hospitals in Malawi had COs and one or more expatriate doctors with a training in Tropical Medicine. Even a much more recent survey showed that 92% of district surgical work (primarily obstetric) is performed by non-surgeons (COs), and 95% of the anaesthesia providers are non-physicians.[1 – ed.] In time, the tropical doctors went back to their home countries and were replaced in the district by new graduates from the College of Medicine who had little formal surgical training. Many of the COs rotated between departments and into administrative positions or joined NGOs in search of new opportunities, so the surgical capacity in the district hospitals diminished."

"In order to improve the surgical care of patients at the district hospitals, a plan was formulated by the College of Medicine and other stakeholders to develop a specialisation degree course in surgery for COs in Malawi. The basic CO training consists of four years of practically orientated training with a diploma. A bachelor's degree course would provide them with a higher level of surgical skills training and would lead to promotion opportunities and a better outlook on salary."

The clinical officer surgical training in Africa (COST-Africa) project (2011-2016) in both Malawi and Zambia offered a three-year BSc surgical specialisation course which also included studying the impact of the training. The project was evaluated as having a very significant impact on the surgical capacity and as being cost-effective.

THERE IS STILL A DEMAND FOR SPECIALISED CLINICAL OFFICERS SINCE IT WILL TAKE ANOTHER GENERATION BEFORE THERE WILL BE AN ADEQUATE NUMBER OF TRAINED DOCTORS AND SPECIALISTS IN THE DISTRICT HOSPITALS

The subsequent SURG-Africa project is the follow-up project to provide mentorship and further strengthen the surgical systems in the district hospitals.[2]

### THE SET-UP OF THE TRAINING PROGRAMME

The curriculum of the BSc surgery for clinical officers was based on work done by Dr Peter Jiskoot who developed a surgical course previously for the Mzuzu University in northern Malawi. Prof. Borgstein and his colleagues, together with the investigators of COST-Africa, built on Jiskoot's work to initially establish the curriculum for the BSc surgery for the College of Medicine in Blantyre. Subsequently, five other courses were developed: obstetrics and gynaecology, paediatrics, general medicine, orthopaedics and anaesthesia. The curriculum has since been revised as part of the ongoing quality assurance activities of the College of Medicine. Requirements for application to the course are a diploma in clinical medicine and a minimum of two years' working experience.

The first (general) part of the curriculum consists of six months basic science theory including biomedical sciences, pathology and human physiology, followed by a modular part (based on specialty) of 24 months, combining practice and theory in a district hospital. The final part includes a training in advanced surgical skills in a central hospital lasting for eight months.[2]

"Initially, the programme was set up as part of a European Union funded research project COST-Africa, so there were few financial constraints when implementing it. The subsequent BSc surgery groups, outside of the project, were more difficult to organise since the Ministry of Health did not supply the necessary funds". However, according to Borgstein, "there is still a demand for specialised clinical officers since it will take another generation before there will be an adequate number of trained doctors and specialists in the district hospitals."

### ON-SITE SUPERVISION AND MENTORING

As part of the follow-up SURG-Africa project*, which aside from Malawi also involves Zambia and Tanzania (2017-2021), surgical specialists, obstetrician/gynaecologists and anaesthesiologists are trained to supervise and mentor district hospital surgical staff, including COs. "Some of the supervisors are experienced COs themselves, others are surgeons or specialist trainee. General surgical procedures that are performed during supervision include exploratory laparotomy, trauma surgery and ruptured spleen procedures. However, the supervision is also very dependent on the level of expertise of the surgical staff in the district hospitals, which means that the supervisors tend to focus more on the most commonly performed procedures such as hernia repairs. In order to adapt to the surgical needs of the hospital, they tried sending more senior surgeons or senior surgical trainees to act as mentor and carry out the supervision." Another solution, suggested by Borgstein, might be in the form of remote learning, both for continuous professional development and more real-time support for surgery in district hospitals. This has gained more importance specifically during the current Covid era.

"A big success for SURG-Africa was the establishment of a surgical consultation network: WhatsApp is used as a platform to send encrypted messages and images from the district clinicians to central hospital consultants. COs can then consult experienced clinicians by sending pictures or questions regarding their cases. This procedure was ethically cleared by the medical council in Malawi, as patients remain anonymous and pictures are not shared without permission."

This form of consultation is very cost-effective not only because of the low equipment costs but also by preventing unnecessary referrals to a city hospital and, moreover, by reducing costs and waiting time for the patients. There is also a significant teaching component as all the members of the group learn about the best way to prepare emergency cases for referral, which patients to refer and when, and receive feedback on patients referred.[3]

### EVALUATION AND EXPANSION OF SURGICAL CARE

"Especially for a small country like Malawi, the upscaling of surgical training for COs to a BSc level has been a big achievement. The number of people interested in training remains high, and the college fees are not that expensive. Currently, the College of Medicine provides the training courses and has developed similar courses in other specialties. District hospitals tend to perform more surgical interventions and thus need more specialty trained COs. Furthermore, while surgical care used to have little or no dedicated funding, district hospitals are now paying more attention to the expansion and provision of quality surgical care for their patients.

However, there are still many challenges that hinder the expansion of surgical health services. There tends to be little interest in surgery from the supervising and managing district medical staff. In Malawi, historically, the doctors were trained to be more involved with the management processes at the district hospitals and less involved in clinical work, especially not in surgery. Hence surgery is often of lesser priority in the district health plans than for instance obstetrics and gynaecology. As a result, the district hospitals are under-resourced in terms of anaesthesia availability and surgical consumables such as sutures, so surgical cases often have to be referred to the city hospitals. Most importantly, the success of these projects largely depends on the partnership of the consortium member institutions involved", according to Borgstein.

COSECSA and the College of Medicine in Malawi focused on the local components and relationships to set up the surgical training and mentoring and expand the care in the district hospitals. COSECSA, the largest training institute in Sub-Saharan Africa, provides specialist training for surgeons and, they always encourage programmes that improve the quality of surgery. In many different countries, they also engage in the training of clinical officers and non-specialist surgeons through their support and involvement in quality control of the different

projects. Borgstein: "COSECSA is so successful because it was developed by clinicians aware of the surgical needs and problems, while their involvement in the different projects and countries evolved over time, establishing a natural collaboration. By the end of 2020, COSECSA had trained 500 surgeons and provided training programmes in over hundred sites in fourteen countries and in seven different specialties within surgery: paediatric, plastic, cardio thoracic and neuro surgery, urology, ENT and orthopaedics." In the future, COSECSA aims to train the surgical trainees over all the countries with similar training programmes (including Malawi, Zambia, and Tanzania).[4]

In conclusion, Borgstein mentions that the role of general surgery has been changing a lot recently, with a higher demand for surgical specialist care and COs with a BSc working at the district hospitals. There is, however, still room for improvement in the district hospitals as the focus remains on other priorities, and they could upscale quality surgical care with limited costs.

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**More information on SURG-Africa, their publications, and the consortium partners, can be found here: https://www.surgafrica.eu/*

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# Reflections on the results of implementation research in the field of surgery

Since June 2012, I have had the privilege of serving as one of the principal investigators in two consecutive European Union funded research projects on surgery in resource-limited settings: COST-Africa and SURG-Africa.[1]

The COST-Africa project (2012-2016) provided improved surgical training of non-physician clinicians (NPCs) in Malawi and Zambia. The SURG-Africa project (running until June 2021) included Malawi, Zambia, and Tanzania – the latter country having a long history of assistant medical officers (AMOs) undertaking surgery in rural district hospitals (Text box A). The intervention supported by this project involved mentoring of surgical teams – based at rural district hospitals – by surgical specialists, obstetrician/gynaecologists, anaesthesiologists and senior theatre nurses. For more details about surgical mentoring and how this is implemented in Malawi, please see the interview with professor Eric Borgstein, elsewhere in this edition of MT*b*. This article focuses on the results of health economics studies conducted by Radboud University Medical Centre (UMC), one of the consortium partners in SURG-Africa.

A

**BACKGROUND AND AIM OF SURG-AFRICA PROJECT**

Guided by a health systems-strengthening framework, the Scaling up Safe Surgery of District and Rural Populations in Africa project (SURG-Africa) implements and evaluates surgical mentoring with a view to scaling up the delivery of accessible elective and emergency surgery at district hospitals to national level programmes in Malawi, Zambia and Tanzania. The overall aim is to implement surgical systems that deliver safe, affordable and sustainable essential surgical services to rural populations in low- and middle-income countries.

## COST OF SURGERY

In our studies, we calculated the costs of all types of resources that hospitals use in providing surgery (e.g. infrastructure, personnel, supplies, utilities, transport), irrespective of whether or not patients pay a fee. Surgical services typically constitute 18-24% of the total cost of running a district hospital.[2-4] Another study established the financial challenges that patients and their households face when they undergo surgery: while direct payments for surgical services may be limited because of

government funded free healthcare policies, the combined burden of indirect payments and lost income often leads to impoverishment and therefore precludes universal access to surgery (Text box B).

**B**

**HOUSEHOLD COST OF SURGERY**

Out-of-pocket household expenditure associated with essential surgery in Malawi is high and, in many instances, catastrophic, putting households, especially those who are already poor, at risk of further impoverishment. In a study conducted in 2015-2016, for example, catastrophic expenditure for hernia surgery occurred in 94% of district and 87% of central hospital patients. When indirect costs were added to the out-of-pocket expenditure, it constituted more than 10% of the monthly per capita household income for 97% and 90% of the district and central hospital patients, respectively. We concluded that the much needed scaling-up of surgical services in rural areas of Malawi needs to be accompanied by financial risk protection measures, such as health insurance.[5]

## SUCCESSES

We also explored the complex dimensions of implementing surgical team mentoring through a technique called 'group model building': we had interactive workshops with health professionals involved in the provision of surgery to obtain greater insight into how complex adaptive systems (in our case surgical systems) work.[6] In Malawi, for example, this resulted in several scenarios – all fitting in with national policy and regulations – to increase incentives to perform quality surgery at the district hospital level and strengthen the referral of surgical cases that require specialist care.

Joint work resulted in scientific output (23 peer-reviewed publications so far) but also, and more importantly, gave support to district hospital level surgery for (mostly) rural populations. We see a tendency that more surgery is being done (paper yet to be published), with a larger variety of surgical procedures being undertaken for common conditions, be they obstetric, gynaecological, orthopaedic or trauma-related, or belonging to the broad domain of general surgery. In addition, we see fewer unnecessary surgical referrals. Changes in surgical outcomes are still being analysed. However, we can already say that, while surgery used to be a stepchild with little or no dedicated funding, we now see district hospitals paying more attention to the provision of quality surgical care.

Two factors have been particularly important for our successes. First, our close partnerships with professional associations, which have driven the surgical training and mentoring and played an active role in the research part, in particular the Surgical Society of Zambia (affiliated with the University of Zambia), the Tanzania Surgical Association, and the College of Surgeons of East, Central and Southern Africa. Second, the establishment of the Lancet Commission on Global Surgery, the release of its landmark report,[7,8] and the adoption of World Health Assembly Resolution 68.15.[9] These three events provided impetus for several countries in Sub-Saharan Africa, including Zambia and Tanzania, to develop and adopt national surgical, obstetric and anaesthesia plans, which lay the foundations for strengthening surgical services and working towards making them universally accessible.[10] The SURG-Africa team is proud to be part of that process.

## LESSONS LEARNED

With the SURG-Africa project now drawing to a close and the consortium team gearing up for dissemination of results on Global Surgery Day (May 25th), one may ask: could we have achieved more? Yes, we could! Under COST-Africa we made a slow start, and the evaluation of the surgical training programme for clinical officers could have been more robust in its design. Collectively we learned from that, and under SURG-Africa our partnership further matured, with stronger leadership within the consortium member institutions themselves. While we have strong working relationships with policy makers, researchers, hospital managers, clinicians and professional associations, our connection with national policy-making processes is somewhat erratic.

The European academic partners (Royal College of Surgeons in Ireland, Oxford University and Radboud UMC) are translating the evidence on what works and what doesn't work into policy messages, taking into account the local context. Our Malawian, Tanzanian and Zambian colleagues are much better at setting the right tone and seizing opportunities for influencing policy. I believe this is something which characterises our partnership: consortium partner institutions have a common purpose, play complementary roles, and treat each other with respect.



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# Surgical task-sharing in collaboration with the Sierra Leonean Ministry of Health and Sanitation: ten years of experience by CapaCare

*On-the-job training in the theatre*

CapaCare is an international non-governmental organisation established in 2011, currently registered in Sierra Leone, the Netherlands and Norway. Its main programme to date has been to strengthen surgical care in Sierra Leone. This West African country has some of the poorest health indicators globally, such as 717 maternal deaths per 100,000 live births and an unmet surgical need of 91%.[1,2] Reasons for these grim health statistics include shortage of surgical professionals with adequate skills.[3] CapaCare aims to strengthen the healthcare system through medical education in the Surgical Training Programme (STP).[4] The STP is a task-sharing programme training community health workers in life-saving general and obstetrical surgery. The programme is hospital based, and the students go through four different clinical rotations of six months each and follow fulltime training modules in surgery, obstetrics, sonography, traumatology, and urology in between their rotations. Close collaboration with the Ministry of Health and Sanitation (MoHS) since the start has been vital to ensure that graduates are incorporated into the national healthcare system as surgical assisting community health officers (SACHOs).[5]

## THE TRAINING PROGRAMME

In the past ten years, 106 students enrolled in the STP of whom 52 have graduated as SACHO. Also 106 students enrolled in the STP of whom 52 have graduated as SACHO. They work in 25 different hospitals across the country, close to three quarters of these are government facilities, and close to 80% are based in rural areas. In December 2020, 32 students were still in training. All students start the training in the same private partner hospital. After six months, they continue their training by doing various rotations in some of the thirteen affiliated hospitals, a mixture of both governmental and private institutions. The shift of training sites from private to governmental hospitals has been a deliberate decision to develop competencies and adequate supervision within the MoHS hospitals.

The curriculum was developed from the World Health Organization's (WHO) Emergency and Essential Surgical Care (EESC) programme, which aimed to address the lack of adequate surgical capacity as a global public health issue. In particular, the book *Surgical Care at the District Hospital* served as a content guide.[6] Over the years, additional materials and courses have been developed, including digital study material. A good example is a freely available e-book on bowel anastomosis, which has been developed together with the Dutch company MLX.[7]

All students and graduates are requested to record their surgical procedures in a logbook.[6] This allows CapaCare to follow students' individual development, evaluate the programme, report to donors and to advocate the need for regulation, remuneration and recognition of the new surgical cadre developed within the country towards stakeholders.[8] Since the start of the programme, a total of 61,740 procedures have been recorded, of which 47,772 (77%) were performed by trainees and 13,968 (23%) by graduates. Half (50%) of the procedures are in general surgery, followed by obstetrics (46%) and orthopaedics/trauma (4%). The latest internal survey conducted in 2017 in all hospitals offering surgery in Sierra Leone showed an annual number of 27,928 operations performed by the graduates of this programme.[9-11]

The development of the STP would not have been possible without the involvement of seventeen Dutch medical doctors global health and tropical medicine (tropical doctors) over the years, who have been involved in the design, training, organisation and guardianship of the programme.[14] Their understanding

*Graduation ceremony of STP students*

of low-resource health settings and intercultural communication along with their medical technical skills and knowledge made them of great value for the students and graduates. Their presence in Sierra Leone was a constant factor during the past 10 years, and contributed to a solid collaboration with the MoHS and other partners.

## COLLABORATION WITH THE MINISTRY OF HEALTH AND SANITATION

Involvement of and collaboration with the MoHS have been undisputable and a core value for CapaCare from its onset. However, as an initially unknown small start-up without any track-record, it was challenging to seize the attention of the right people at the national level. Furthermore, task-sharing was and still is controversial as surgical programmes were not part of any governmental strategy, and the surgical community in Sierra Leone is sceptical towards opening up training for non-doctors. In the early days, the meetings in the ministry did not lead to any tangible progress. Therefore, in 2010, CapaCare decided to propose a small pilot to the MoHS as a means to test their concept of the three-year diploma training.

Crucial to the establishment of the programme was the endorsement by key persons, such as the director of training within the MoHS and the Minister of Health and Sanitation. They have advocated task-sharing to strengthen emergency health services and as a means of expanding the number of skilled health personnel at the district level. The improvement of the poor maternal health statistics was key on the national agenda. With their help and permission, a memorandum of understanding was signed and the programme of CapaCare was able to scale up.

## NATIONAL ENGAGEMENT IN THE PROGRAMME

CapaCare meaningfully engages with both the MoHS and the key actors among surgeons and obstetricians in Sierra Leone. Therefore, a broad range of collaborating partners are involved in crucial steps of the programme. Sierra Leonean doctors and surgeons work as trainers and supervisors at the partner hospitals and act as mentors during the one-year traineeships in tertiary governmental hospitals. Selection of candidates for training and examination of the students is done in joint collaboration with local health providers and representatives of the MoHS. The chief medical officer of the MoHS signs the diploma awarded upon completion of the training. Strong involvement of the MoHS in our training programme has been expanded gradually over the years. Unfortunately, SACHOs have still not been officially recognised and regulated as new health professionals by the MoHS. Part of the reason is the fact that community health workers – a profession that most graduates have as background – have not been legislated and regulated since the start in the early 1980s.[12] Consequently, the official legal establishment of the SACHO as a new profession is challenging and suffering from delays.

As a result, many SACHOs working in governmental hospitals are not included in the national payrolls, which also often happens to other health workers in Sierra Leone. Although their determination to remain active as surgical providers is often rooted in personal experiences of losses of close family members rather than status and salary, this clearly demotivates the affected graduates.[13] It makes them feel unrecognised, undervalued and unsafe in their working environment.In dialogues with the MoHS, CapaCare has advocated for the legal recognition of SACHOs, as we believe it is a crucial step in keeping the graduates motivated. In this context, the establishment of a student union in 2015, which is creating ongoing advocacy for SACHOs and trainees, has been welcomed by CapaCare.

## FUTURE PLANS

CapaCare is currently developing a post-training package to engage graduates as trainers for the STP. Together with increased involvement of other Sierra Leonean trainers, the programme will be less dependent on international consultants. In order to make the programme sustainable in the long run, CapaCare has started a collaboration with a training institution in Makeni (the northern provincial capital), under the responsibility of the MoHS. The collaboration focusses on developing local Sierra Leonean trainers and further embedding the programme within the country. In collaboration with the MoHS, CapaCare eventually plans to step back in favour of local ownership and sustainability.

This year CapaCare is celebrating its tenth anniversary: a moment to reflect and to look forward. From an organisational perspective, CapaCare has grown professionally; although this has been challenging, there are well-established relationships with local and national partners. These partners aim for the same goal: serving the health needs of the local population. These joint efforts enable CapaCare to look positively forward and to continue developing its programme. It is our belief that task-sharing is critical in building capacity for surgical care in low- and middle-resource settings such as Sierra Leone.

## TASK-SHIFTING VERSUS TASK-SHARING

'Task-shifting' is defined by the WHO as the rational re-distribution of tasks among health workers in order to make the most efficient use of the existing workforce.[15] 'Task-sharing', is based on the division of tasks within a team, whereas task-shifting is more focused on individual skills.[16] A team-based approach is essential throughout the entire STP programme, and it is therefore a task-sharing training programme.

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# Partnerships in gynaecologic oncology: introducing the IGCS mentorship programme in Uganda

In 2018 approximately 570,000 women were diagnosed with cervical cancer worldwide, and 311,000 died of the disease, of whom 90% were living in low- and middle-income countries (LMICs).[1] Global projections show that the incidence of cervical cancer will further increase with a continuous unequal burden in LMICs. It was also in 2018 that the World Health Organization (WHO) launched its call for action to eliminate cervical cancer, an important step in the continuing fight against this deadly and preventable disease. As a result, many governments of LMICs and high-income countries (HICs) are being urged to take action. The WHO has set targets to achieve a global coverage of 90% for human papillomavirus (HPV) vaccination, 70% for screening, and 90% for treatment by 2030.[3] Consequently, there is a need for more trained professionals with expertise in gynaecologic oncology.

Before the effect of HPV vaccination will become evident, increased cervical screening will result in growing numbers of patients diagnosed with precancerous cervical lesions and early-stage invasive carcinoma in need of adequate treatment. The expected increase, however, will not solely apply to cervical cancer. As a result of the demographic changes in population in LMICs, non-communicable diseases are increasing and are expected to rise even more in the near future. While there is a known severe shortage of health care workers in general in LMICs, this seems to be more acute for physicians specifically trained in surgical oncology, leaving many parts of the world underserved in the (surgical) care of patients, including women with gynaecologic malignancies.[4-6] The scarcity of oncologic care in LMICs leads to a high mortality and burden of disease.[4] In this paper we introduce you to a mentoring programme in the field of gynaecologic oncology in Uganda, illustrating the needs, opportunities and challenges of an international partnership addressing these needs.

## THE IGCS MENTORSHIP PROGRAMME IN UGANDA

In 2017, the International Gynaecologic Cancer Society (IGCS) launched the IGCS Gynaecologic Oncology Global Curriculum & Mentorship Programme to address this shortage of trained health care workers specialised in gynaecologic oncology, by training local gynaecologists carefully selected by a board of clinicians.[7] This two-year programme is a capacity building initiative to equip health workers with a basic toolkit adapted to their particular context. In total, twelve training sites in twelve different countries were identified, including Uganda.

The programme started in 2017 at the Uganda Cancer Institute (UCI) in Kampala, the capital city. UCI is the tertiary referral hospital for oncology in Uganda and trains fellows with interest in gynaecologic oncology. The selection process for the trainees is run by UCI and includes a panel of local mentors, public health experts and administrative staff.

## THE UGANDAN PROGRAMME INVOLVES FIVE ELEMENTS:

1. Twinning: international mentors from UCSF (University of California San Francisco), Duke University, Leipzig University and Leiden University partner with local mentors and fellows. The external mentors are registered at the Ugandan national medical council.

2. Virtual education: the fellows follow a web-based curriculum and participate in monthly video conferences with their international mentors and monthly virtual tumour-boards.

3. Hands-on training: the international mentors travel to Uganda two to three times a year for hands-on open surgical training (including LEEP and cervical conisation). Patients usually have been selected for surgery prior to the arrival of the international mentor. When possible, two operation rooms run simultaneously to enable mostly open surgery on all selected patients and to maximise teaching opportunities. During their visits, international mentors are also involved in teaching, live tumour-board meetings, and research. Fellows have the opportunity to travel to the institution of the international mentors for one to three months during their fellowship. Fellows participate in tumour-boards and journal clubs at the host site and observe complex surgery. Since registration for fellows as medical doctor in the host countries can be very time consuming and time is relatively short, this observation can be considered a good alternative to hands-on training. Often Ugandan (Sub-Saharan) medical professionals face exceptional hurdles when registering in host countries. It is a protracted and expensive process, since a number of literacy and professional exams are mandatory and costly.

4. Portfolio: both international and local mentors evaluate the fellow's progress with local mentor evaluation

reports, surgical case log review, and interim knowledge assessments.

5. Examination: upon completion of the programme, each fellow will take a final examination (combination of written and oral) and, if successful, will receive a certificate of satisfactory completion of training.

Since the programme's inception in 2017, two fellows have successfully completed the training in Uganda and are now involved in the gynaecologic oncology faculty activities. Three other fellows are scheduled to take the final exam this year.

In Uganda, the costs for the fellowship have been subsidised by a grant provided by the African Development Bank for a period of five years. It covers salaries of the fellows for the duration of two years. At the same time the UCI is trying to convince the Ministry of Health to recruit and formally retain the new gynaecologic oncologists.

## CHALLENGES OF THE PROGRAMME

The contextualisation of specialised care poses a conflict for physicians regarding knowing the optimal management for the patient or providing what is available. Besides providing higher quality of care for a subgroup of patients, it will also lead to complex ethical dilemmas.

The infrastructure required to practice their subspecialisation is lacking.[8] For example, many hospitals are not equipped with fully functional high dependency units or intensive care units, or if present these are understaffed, especially the nursing teams. Therefore, postoperative care for complex surgical cases such as ovarian cancer surgery and radical hysterectomies is compromised. Specialised care will be centralised in the capital city, limiting treatment possibilities for patients in more rural areas.

Besides the inadequate medical infrastructure, there is a lack of budget for medical specialists with a subspecialisation. Many health care professionals will be interested to specialise further and there is a clear need in the area of gynaecological oncology. Subspecialists are however not yet recognised as an official category (with its attendant salary, emoluments or benefits), and therefore potential subspecialists could question why they should undertake such an intensive training if it will not be recognised upon completion.

In Uganda, this problem is reflected by the first fellows who graduated from the programme in 2019. So far, none of them have been able to find a position in the formal civil service of Uganda with an emphasis on gynaecological oncology. This is partly due to the novelty of the subspecialisation with no formal vacancies available and budgetary constraints. Currently fellows are working at UCI and the Mulago Woman's Referral Hospital in gynaecological oncology clinics under a small grant, expected to last a few years. Because of these limitations, the fellows can only utilise some of their acquired skills. Involvement of the Ministry of Health is needed for a sustainable solution. This will make gynaecological cancer care accessible for women in the country and will ultimately reduce the burden of gynaecological cancers in Uganda.

The ongoing Covid-19 pandemic and associated disruptions have spawned a melange of additional challenges for the programme. For the last nine months, no international mentor has been able to visit Uganda as a result of the lockdown. Mandatory Covid testing of all patients prior to surgery at the patient's cost (circa US$ 65) further disrupted surgical practice. Patient numbers greatly decreased during the initial lockdown and only recently started picking up after the lockdown was halted.

## CONCLUSION

Despite its challenges, the IGCS membership programme provides a unique opportunity to train motivated and experienced local gynaecologists in a contextualised set of skills and to provide gynaecological oncology care in settings with a high demand. As cancer cases are expected to increase in the near future, including gynaecological malignancies, the provision of cancer care will increasingly become of vital importance. To embed this care into the existing health care system, strong collaboration with the Ministry of Health is needed. The lessons learned from this membership programme will guide future training of subspecialists in low-resource settings.

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# Anaesthetists wanted: addressing the disparity of care providers in surgery in low-resource settings

The following article is based on an interview conducted with Dr Jakub Gajewski and Dr Papytcho Ntambwe in January, 2021.

**Dr Jakub Gajewski** is the director of the research programme of the Royal College of Surgeons in Ireland (RCSI) Institute of Global Surgery. He is the international coordinator and the lead researcher for the SURG-Africa project.

**Dr Papytcho Ntambwe** is an anaesthesiologist who works at Livingstone Central Hospital in Zambia, one of the hospitals involved in SURG-Africa.

Over the past decades, there have been numerous approaches and attempts to increase surgical capacity in low-resource settings. Many have unfortunately overlooked a fundamental tenet without which most surgeries cannot occur: for a patient to undergo a surgical procedure, they must first be properly anaesthetised. In most low- and middle-income countries (LMICs) across the world, the extreme shortage of well-trained anaesthetists is not only shocking but is in many ways compounding systemic challenges that already leave hundreds of millions of people without access to basic lifesaving and life altering surgical procedures.[1]

## SHORTAGE OF ANAESTHESIOLOGY PROVIDERS

The SURG-Africa project, funded by the European Union's Horizon 2020 programme,[2] started in 2017 with the aim of assessing and implementing surgical systems that deliver safe, affordable and sustainable essential surgical services to rural populations in LMICs. At the beginning of this project, the research team examined the current state of surgical care in the three countries involved - Tanzania, Malawi and Zambia - in order to improve understanding of systemic challenges and limitations. Based on the results, Dr Gajewski, the lead researcher for SURG-Africa, and his team found that in these areas, many of the shortages and gaps in surgery could be attributed to the limitations in the capacity of anaesthesia. There was not a single anaesthesiologist present in any of the surveyed hospitals at the district level, and even in national level hospitals the number of medical doctor (MD) anaesthetists was shockingly low. "In Zambia, there are only 26 MD anaesthetists in the entire country serving a population of 18.7 million people, whereas in Malawi that number is, even more shockingly, four MD anaesthetists for 19.4 million people", according to Gajewski. Upon further examination, Gajewski confirmed that the extreme lack of anaesthesia providers in the three countries taking part in the study was not an anomaly, but rather evidence of an issue seen throughout many LMICs in the world - particularly across Sub-Saharan Africa.

## CHALLENGES IN CREATING AN ADEQUATE WORKFORCE OF ANAESTHETISTS

The lack of qualified anaesthetists has created an uneven balance between anaesthesia and surgical providers, the latter being comparatively much better staffed in these regions. This mismatch has a detrimental effect on surgical capacity and limits the types of procedures that can be performed in many health care facilities, accounting for significant morbidity and mortality when insufficiently trained health workers are tasked with administering anaesthetic agents. "There are far more people who can do an operation than who can anaesthetise the patient. That means that if you have only one person as part of the operating team who can anaesthetise, that person would need to work all the time, which is impossible", Gajewski explains.

Dr Ntambwe, an anaesthesiologist working in Livingstone Central Hospital in Zambia, offers a local insight on why so many more physicians turn to surgery and away from anaesthesia, explaining that there is a lack of incentive to work in anaesthesiology. The constant demand placed upon anaesthetists would require them to work significantly more hours than numerous other specialties in medicine: "A clinical officer anaesthetist has to work eight hours a day, whereas a clinical officer psychiatrist works four to six hours a day, but they end up getting the same salary."

Dr Gajewski adds that many physicians are propelled into surgery by the perceived social benefits that come with the role: "In the northern hemisphere,

*(From left to right) Luneta Victor (ML), Bulanda Chilala (anaesthetist) and Dr Hansingo (surgeon SURG-Africa mentor team) during a caesarean operation at Namwala District Hospital, Zambia. SURG-Africa/Antonio Jaén Osuna*

*Elizabeth Mbeta, anaesthetist SURG-Africa mentor team at Mwanza District Hospital, Malawi. SURG-Africa/Antonio Jaén Osuna*

surgical care is more of a teamwork approach, whereas in these settings the surgeon is the dominant figure. He gets power and influence over the whole team, so people strive for that."

Of the very few MD anaesthesiologists who work within these countries, many can end up being the only person with their specialty in a specific facility or institution. Without a network of well-trained colleagues to continue learning and receive supervision from, it is hard for many workers to maintain their level of skills and knowledge. Gajewski refers to this phenomenon as "professional isolation", where anaesthetists who may have been initially well trained may end up lacking skills they would acquire with more access to training, resources, and mentorship. This can account for a significant reduction in the skill and ability of an already limited workforce, further hindering surgical capacity.

This limited workforce exists on top of shortages and extensive gaps in equipment and supply. These range from disruptions in water and electricity, limited counterfeit and low-quality medications, shortages in supplies that extend from gloves to oxygen, obsolete equipment and machines, and insufficient sterilisation techniques, to name a few. Such challenges to an already resource-deprived health system increase the importance and value of having capable and well-trained providers in every specialty, including anaesthesia.

## SOLUTIONS AND EFFORTS TO IMPROVE WORKFORCE

Recognition of the severe shortages of anaesthesia providers has put emphasis on the need to improve the capacity of the workforce going forward. Although the shortage of anaesthesia providers varies from country to country, many nations are implementing parallel programmes and strategies to create a larger, more skilled and interconnected workforce of anaesthetists.

An example of this effort to improve the capacity of the workforce on a local level is seen in one of SURG-Africa's projects, which brings mentorship and supervision to isolated providers in district level hospitals. Such interventions aim to address professional isolation and increase the capacity of existing providers by reinforcing a more cohesive team approach. "There was a surgeon, an anaesthesiologist and a nursing specialist to supervise, train and mentor local teams, providing them with the latest knowledge within the discipline. The idea was to do better within existing skills, rather than just to expand," explains Gajewski.

On a regional level, an initiative has been started by CANECSA (the College of Anaesthesiologists of East, Central and Southern Africa)[3] training new MD anaesthesiologists through an IrishAid supported collaboration programme. The constituent member countries of this initiative are Eswatini, Kenya, Malawi, Rwanda, Tanzania, Uganda, Zambia and Zimbabwe. Training provided in institutions accredited by CANECSA is aimed not only at expanding the workforce but also at improving the quality of care.

Merely increasing the number of MD anaesthesiologists, however, is not feasible as a standalone strategy to fill what is an immense gap. Zambia offers a two-year training of registered nurses to become anaesthesia providers, part of an effort to train a capable workforce of non-physician clinicians (NPCs) to become non-physician anaesthesia providers (NPAPs). This strategy of increasing the NPAP workforce is seen as the only way in the short term to supply the necessary number of anaesthetists to keep up with surgical demand. The usage of NPAPs is becoming increasingly prevalent in many forms throughout numerous countries in the world, including high-income countries.

There is some doubt, however, that a two-year training course is sufficient to train NPCs to work autonomously in a role so challenging and with such dire consequences when not performed properly. According to Dr Ntambwe, it has been a challenge in Zambia. "After the two-year training, it takes time for these nurses to be able to work autonomously in terms of providing anaesthesia. Therefore, they go for an internship in the big centres for another year. But still, in the end, they will only be able to provide anaesthesia for the basic emergency surgeries which are performed in the district hospitals. For the other surgeries they will need to refer." To this, Dr Gajewski adds a positive note: "Despite these challenges, growing research evidence does show comparable surgical or anaesthesiologic

outcomes between non-physician and physicians, as long as you put a clear ceiling on their tasks and qualifications, and provide periodic supervision."

### GOING FORWARD

Global health programmes are continuing to work to improve the capacity of the existing anaesthesia workforce through research and advice on training programmes, but many experts like Dr Gajewski are adamant that change will have to come from initiatives within the health ministries. "In order to achieve sustainable improvements in manpower, as well as equipment and supplies, the leading role should be with the ministry", Gajewski explains. "The global health community should step away a bit to allow local empowerment. Running just on projects is not the way to go. The results of the projects are presented to the ministry, but eventually they need to take over and be in charge, be responsible and accountable towards their own clinicians and patients who are the voters in how to make the system better." For now, Zambia and other countries in the area grapple with the added burden of the pandemic and its associated surgical disruptions. Dr Ntambwe informs us that presently (January 2021), the country has suspended elective surgeries to accommodate the heightened demand on health systems created by the Covid-19 pandemic.



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# A neonate with gastroschisis

### CASE

At a district hospital near Lake Victoria in Tanzania, a 21-year-old primigravida gives birth to a term neonate. The delivery is uncomplicated, but the newborn has an abdominal wall defect with herniated intestinal loops just right of the umbilical cord. In the absence of a membranous sac covering the viscera, the neonate is diagnosed with gastroschisis. The newborn is taken to the neonatal intensive care unit (NICU). The intestines are covered with sterile gauze and gloves, the stomach is decompressed with a nasogastric tube, intravenous fluids and oxygen are given and a surrogate silo is made with soft saline bags. Referral to a tertiary centre is considered, but the condition of the neonate deteriorates the next day when a hypovolemic shock develops resulting in ischemia of the intestines. In consultation with the family, the neonate is discharged to die at home.

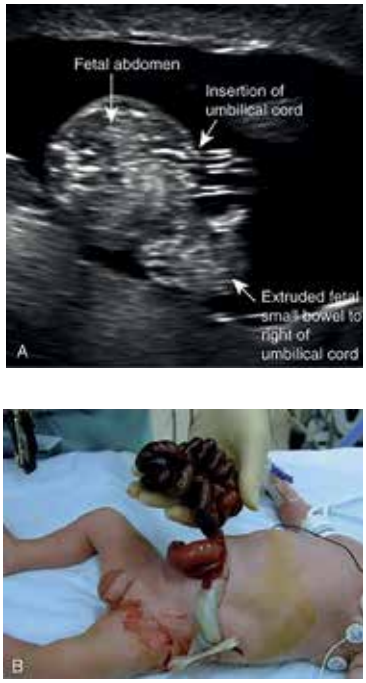


*Figure 1. An illustration of gastroschisis. A) a sonogram showing the defect in a sixteen-week foetus. B) a newborn with herniated bowels through a defect in the abdominal wall which are not contained within a membranous sac.*[2]

### BACKGROUND

Birth defects are one of the leading causes of death in children under five.[1] Gastroschisis is one of the commonest congenital anomalies. It is a defect of the anterior abdominal wall through which the intestines herniate (Figure 1A and B).[2] Contrary to two other common abdominal wall defects (umbilical hernia and omphalocele), the bowels are not covered by respectively skin or a membranous sac.[2] Gastroschisis has a wide range of clinical presentations, from simple gastroschisis to patients with complex gastroschisis, whereby the defect is complicated by for example intestinal atresia or intestinal necrosis.[3] Gastroschisis is usually isolated and has no known associated chromosomal anomalies.[2] The incidence of gastroschisis is about 1:3000 births and seems to have increased over the last three decades for unknown reasons.[2,4]

### TREATMENT

The main goal of treatment is reduction of the eviscerated contents into the abdominal cavity followed by closure of the defect. The most utilised methods are: operative primary reduction versus staged/gradual

reduction over a few days using a silo. A silo is a sterile plastic bag which protects the intestines. The reduction is followed by either sutured immediate closure or sutureless delayed closure. The chosen technique depends on the condition of the intestine and the capacity of the abdominal cavity, as high intra-abdominal pressure might lead to abdominal compartment syndrome.[5] The optimal surgical method for gastroschisis in high-income countries (HICs) remains contro-versial.[4] In low-resource settings, preformed silos may be the most suitable method to treat gastroschisis.[4] This method minimises the risk of abdominal compartment syndrome and the necessity of intensive care. Another advantage of the silos is that a medical officer or specialist nurse can easily apply it at the bedside, preventing a potential delay until surgery in case of primary reduction. A major disadvantage is the cost with a price of US$ 300 per silo.[4] In some middle- and high-income countries, a ten times cheaper alternative has been used: the Alexis Wound Protector and Retractor. However, its effectiveness has not been evaluated yet. Also, improvised silos using sterile urobags and female condoms have been described, with in general poor outcomes.[6]

## OUTCOMES

The outcomes of gastroschisis vary widely globally. In HICs the survival rates have improved from 10% in the 1960s to currently over 95%.[4] This is mostly attributed to antenatal diagnosis, planned delivery, perinatal resuscitation, the availability of NICUs, parenteral nutrition and improvements in surgical techniques.[6] In contrast to HICs where neonates with gastroschisis are almost sure of survival, the opposite is true for neonates in low-income countries: Uganda and Côte d'Ivoire reported survival rates of 0-2%.[4] In middle-income countries, the survival rates are somewhere in-between, with reported survival rates of 20% in Iran, 25% in Nigeria, and 35-71% in South Africa.[4]

## STATE OF THE ART IN LOW-RESOURCE SETTINGS

Many of the main components of a neonatal surgical care system needed to treat gastroschisis are currently lacking or insufficient in low- and middle-income countries (LMICs). Even though a majority of pregnant women receive antenatal care, ultrasound is often not included or may not be reliable. Consequently, informing the family on the risks in advance is not possible, and many neonates with gastroschisis are born at home instead of in a health centre. Inappropriate prehospital care and delayed access to healthcare may result in hypothermia, hypovolemia and sepsis, and potentially death. Delays also further complicate the treatment of gastroschisis, as the intestines may become oedematous.

Noteworthy is that in many LMICs there is a stigma towards children with birth defects, and hence they may even not reach healthcare at all. Community education about birth defects and the availability of treatment will be helpful. Neonatal resuscitation may be delayed or ineffective due to a lack of trained professionals. A NICU may not be available. In many low-resource settings, nurses care for many infants, and they may have to focus their care on children who are most likely to survive.[4] Finally, mothers may be insufficiently involved in the care of their child, even though studies have highlighted that this can reduce neonatal mortality.[4] Some of the treatment options require general anaesthesia, for which an educated workforce and specific resources for neonates are needed but are often lacking in low-resource settings. Parental feeding is generally unavailable for neonates, as usually special perinatal nutrition bags for neonates are unavailable. Central intravenous access requires specific training and is often unavailable.

Including gastroschisis in the list of Bellwether procedures could improve the provision of neonatal care (Text box).

## CONCLUSION

There is a large inequality in the outcome of gastroschisis between HICs and LMICs. Several components of a neonatal surgical care system need to be changed or added to improve the survival rates in gastroschisis.



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*Acknowledges M. van Ingen for contribution to the case description.*

### TEXT BOX: BELLWETHER PROCEDURES

In 2015 The Lancet Commission on Global Surgery proposed laparotomy, caesarean section, and open fracture repair as Bellwether procedures. Bellwether procedures are considered as metric to predict the ability of an institution to perform essential surgical interventions. So, if an institution can perform a laparotomy, it is likely that it can also handle a wide range of general surgery. However, these three mentioned procedures might not be useful predictors for the ability to carry out neonatal and children's surgical care. Ford et al. suggested gastroschisis as a Bellwether surgical procedure for neonatal care.[7] Surgical treatment of gastroschisis is considered especially useful as a Bellwether procedure as it requires all the components of a neonatal surgical care system.[4]

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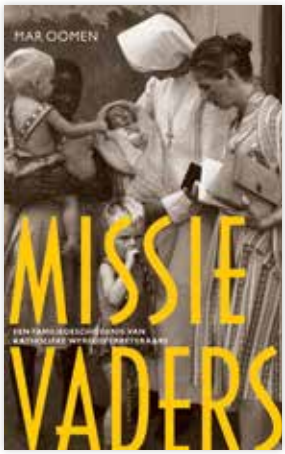
# BOOK REVIEW




## Missievaders: een familiegeschiedenis van katholieke wereldverbeteraars

*Mission fathers: a family history of Catholic do-gooders*

By Mar Oomen
2019, 302 pages
ISBN 978-90-450-3274-0
NUR 680
Atlas Contact
Price: € 12.99 (e-book), € 22.99 (paperback)

The subtitle of this book, nominated in late 2020 for the *Libris Geschiedenis Prijs* (an annual price for history books in Dutch), is telling. Mar Oomen, an anthropologist, reconstructs her parents' and grandparents' life stories.

Her grandfather Janus Oomen and his wife Stans became inspired by Albert Schweitzer and the Catholic faith. They left the Netherlands with their two young children in 1933, travelling by boat to what was then known as the Dutch East Indies. He gathered fame as a medical doctor and laid the basis for his later international career. Besides his work as a WHO advisor in the Far East and as director of the Department of Tropical Hygiene at the Royal Tropical Institute in Amsterdam, Prof. Dr H.A.P.C. Oomen (Janus) was co-founder (in 1962) and manager of Medicus Mundi (which later merged with Memisa and became part of Cordaid). For more than twenty years he served as chief editor of *Tropical and Geographical Medicine*, one of the predecessors of the European journal *Tropical Medicine and International Health*. His contribution to 'tropical medicine' and the science of human nutrition was summarised in a short article (in Dutch) published in the *Nederlands Tijdschrift voor Geneeskunde* (Dutch Journal of Medicine) that celebrated his fiftieth anniversary as a medical doctor in 1982.*

Janus' son Dries Oomen (the author's father) was employed as internal medicine specialist in Tanzania and Ethiopia from 1958 to 1968. Soon after his return to the Netherlands with his family, he obtained a PhD degree based on field research into podoconiosis (non-filarial *elephanthiasis*). Much to his own regret and with feelings of shame, Dries was unable to further pursue his career due to a mental condition. It had its roots during his childhood when he spent harsh times with his elder brother in a camp, separated from their parents, during the Japanese occupation prior to Indonesia's declaration of independence in August 1945. The book describes this period extensively, partly based on letters and diary notes.

This is an interesting read for those of you who used to work in overseas (medical) development cooperation. For the younger generations of international health professionals (including medical doctor Global Health and Tropical Medicine (AIGT), it offers a rich description of the change in thinking, in the Netherlands as well as internationally, about the societal role of the church (not only the Catholic church), poverty, healthcare and North/South relations. It also describes church-affiliated hospitals in Tanzania and their position vis-a-vis their religious congregations with their international networks on the one hand, and how they relate to national and local government administrations on the other hand. This is still topical as many AIGTs these days do part of their medical training or find employment in Sub-Saharan Africa in these same church-affiliated hospitals.

Parts of the story are quite dramatic and heroic, which those of you who have lived and worked in resource constrained environments may recognise. The former predominantly missionary motivation has been replaced in the present generation of Dutch medical doctors by a combination of personal, professional and social motivations, still with a good deal of adventurism. In several instances, the author makes arguable statements, for example in the epilogue: "Of course we know (to some extent) that Dutch Catholic missionaries in the twentieth century made a huge contribution to the christening and so-called civilisation of several parts of the world" (translation lb). The recent book *Revolusi* by David van Reybrouck takes a different perspective in a truly thrilling manner.



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* https://www.ntvg.nl/system/files/publications/19821021300012.pdf



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