THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF HEALTH, COMMUNITY DEVELOPMENT, GENDER, ELDERLY AND CHILDREN

NATIONAL SURGICAL, OBSTETRIC AND ANAESTHESIA PLAN (NSOAP)

2018 – 2025

Cover Photo
Dr. Adelida Mghase (surgeon), Dr. Anneth Mwaigembe (assistant surgeon) and Mr. Calvin Urassa (anaesthetist) perform a surgical procedure at Kahama District Hospital, Shinyanga Region, Tanzania
Photo Credit: Dr. Rose Fovo

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March 2018

Contents

Source: Tanzania Service Provision Assessment Survey 2014-2015

Abbreviations

CEmONC	Comprehensive Emergency Obstetric and New Born Care
CHMT	Council Health Management Teams
CME	Continuing Medical Education
CPD	Continuing Professional Development
DALY	Disability Adjusted Life Years
DMO	District Medical Officer
GDP	Gross Domestic Product
GoT	Government of Tanzania
EmOC	Emergency Obstetric Care
HIS	Health Information System
HIV	Human Immunodeficiency Syndrome
HMIS	Health Management Information System
HRHIS	Human Resource Health Information System
ICT	Information, Communication and Technology
KCMC	Kilimanjaro Christian Medical Centre
LCoGS	Lancet Commission on Global Surgery
MMR	Maternal Mortality Ratio
MOHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
MOF	Ministry of Finance
MRI	Magnetic Resonance Imaging
MSD	Medical Stores Department
MUHAS	Muhimbili University of Health and Allied Sciences
NBTS	National Blood Transfusion Services
NSOAP	National Surgical, Obstetrics and Anaesthesia Plan
PGSSC	Program in Global Surgery and Social Change
PORALG	President's Office, Regional Administration and Local Government
PPM	Planned Preventative Maintenance
RMO	Regional Medical Officer
SDG	Sustainable Development Goals
SOA	Surgery, Obstetrics and Anaesthesia
SS2020	Safe Surgery 2020
TZS	Tanzanian Shillings
UHC	Universal Health Coverage
WDI	World Development Indicators
WHO	World Health Organization

Foreword

The Ministry of Health, Community Development, Gender, Elderly and Children is charged with improving the health and welfare of all Tanzanian citizens. In considering the high burden of disease due to surgically treatable conditions in the country, the MOHCDGEC in collaboration with partners has developed the first National Surgical, Obstetric and Anaesthesia Plan (NSOAP) 2018-2025, to address challenges in access to high quality surgical, obstetrics and anaesthesia (SOA) services in Tanzania.

Access to safe, timely and affordable SOA care is limited for a significant proportion of Tanzanians especially those in rural areas. This lack of access is in large part due to human resources challenges. At present, of the recommended 20 physician surgeons, obstetricians and anaesthesiologists per 100,000 population, there are only a total of 0.46 per 1000,000 Tanzanians in the country making widespread access impossible. Additionally, there are factors such as limited access to surgical and anaesthesia equipment, supplies, medicines, blood and blood products and essential utilities like clean water, oxygen and electricity which exacerbate this situation.

Strengthening the Tanzanian SOA system is imperative to reducing surgically preventable mortality and morbidity. Currently about 19.3% of deaths and 17 % of Disability-Adjusted Life Years (DALY) in Tanzania are attributable to diseases amenable to surgery. Surgical, Obstetric, and Anaesthesia services are critical in reducing the unacceptably high levels of maternal mortality, one of the key sustainable development goals, by making Caesarian sections, post-partum hemorrhage, uterine rupture, ectopic pregnancy and retained products of conception amongst other conditions safer for mothers. Surgery and anaesthesia is also essential in preventing deaths resulting from road traffic accidents, also one of the key sustainable development goals. Additionally, as outlined in the LCoGS, the economic benefits from preventing lives lost and averting disabilities from surgically treatable conditions will be substantial and promote economic development of our Country.

The high costs of seeking and receiving surgical care often places patients at the risk of being impoverished as a result of seeking or receiving surgical care. Currently, about 66% of Tanzanians risk catastrophic expenditure and 86% risk impoverishing expenditure from seeking surgical care. Addressing all components of SOA access, including risk of impoverishment, is crucial to achieving Tanzania Vision 2025, the Global Sustainable Development Goals (SDGs) and Universal Health Coverage.

This NSOAP lays out the necessary steps to improve each of the 6 major domains of the surgery, anaesthesia and obstetric health system: (a) service delivery, (b) infrastructure, (c) workforce, (d) information management and technology, (e) finance and (f) governance. It will be key to act synergistically across all of these health system building blocks to guarantee an impact.

This NSOAP is designed to align with and complement existing government health policies, while addressing unique challenges in SOA service provision. The government of Tanzania, especially the MOHCDGEC, expects that all stakeholders involved in SOA service delivery in Tanzania will align their activities with priorities stipulated in this NSOAP.

Though the task at hand may seem daunting, it's important to remember that by working together, we can accomplish our unified vision of all Tanzanians living healthy and productive lives. With continued commitment from the MOHCDGEC and all partners, we can accomplish the mission set forth in this NSOAP to ensure that by 2025, all Tanzanians have access to safe, affordable and timely surgical, obstetrics and anaesthesia services.

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The Ministry of Health, Community Development, Gender, Elderly and Children would like to thank the NSOAP working group for providing insight and guidance throughout the development of the Tanzania NSOAP 2018-2025. Special gratitude to Dr. Sarah Maongezi from the Department of Curative Services and Dr. Ahmad Makuwani from the Department of Preventative Services for their continuous stewardship of this policy.

This NSOAP could not have been accomplished without the input of a wide range of members of the MOHCDGEC, PORALG, TSA, AGOTA, SATA, CSSC, MAT, APHFTA, surgeons, anaesthesiologists, obstetricians, nurses, civil society partners and NGOs to name but a few. Particular thanks go to the Safe Surgery 2020 initiative, funded by the GE Foundation, for steering and funding the development of this NSOAP.

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Executive Summary

Surgery, anaesthesia and obstetric care is a public health priority. The Lancet Commission on Global Surgery (LCoGS), published in April 2015, estimated that 5 billion people around the world lack access to safe, affordable and timely surgical and anaesthesia care.[1] Passage of World Health Assembly Resolution 68.15 in May 2015 called for the strengthening of emergency and essential surgical and anaesthesia care as a component of Universal Health Coverage, further highlighting the need to address the large gap in surgery, anaesthesia and obstetric care worldwide.[2] One key recommendation of the LCoGS was the development of National Surgery, Obstetric and Anaesthesia Plans (NSOAP). The aim is to simultaneously address all the building blocks of the surgical health system, bringing together all relevant stakeholders and resources towards a common goal in a coordinated way. Tanzania is leading the way, as only the third country worldwide to take on this important task.

Of the 5 billion people who lack access to safe surgical, obstetric and anaesthesia (SOA) care, many of them are Tanzanians. In Tanzania, 19.3% of deaths and 17% of Disability-Adjusted Life Years (DALYs) are attributable to diseases amenable to surgery[3][4]. Lack of access contributes to maternal mortality as mothers cannot access SOA care for the management of caesarean section, post-partum haemorrhage, ectopic pregnancy, breast and cervical cancer amongst others. Lack of access to emergency safe surgical and anaesthesia care causes a significant economic burden due to avoidable death and disability from trauma, mainly in the young working population. Tackling the gap in SOA care will be vital to achieving the sustainable development goals relating to maternal mortality, trauma, non-communicable disease, neglected tropical disease, gender equality and economic productivity. [5]

This NSOAP lays out a strategic plan describing how the MOHCDGEC, PORALG and its partners will overcome specific health system challenges and accomplish the mission of ensuring improved access to safe, affordable and timely surgical, anaesthesia and obstetrics services for all Tanzanian citizens by 2025. The development of this document was led by the Department of Curative Services within the MOHCDGEC and developed through extensive consultation with over 200 stakeholders through one-on-one interviews, focus groups and technical working groups with representation from across the MOHCDGEC, PORALG, civil society organisations, front line health care providers, implementers and funders. The NSOAP is structured around six key domains: Service Delivery, Infrastructure, Workforce, Information Management and Technology, Finance and Governance. The cross-cutting health systems strengthening put forward in this plan will reap benefits far beyond the

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1 Meara JG, Leather AJM, Hagander L, Alkire BC, Alonso N, Ameh EA, et al. Global Surgery 2030: Evidence and solutions for achieving health, welfare, and economic development. Lancet. 2015;386(9993):569–624.

2 World Health Organization, Who. Strengthening emergency and essential surgical care and anaesthesia as a component of universal health coverage Report by the Secretariat. Provisional agenda item 51 [Internet]. 2014;2002(May):16–8. Available from: http://apps.who.int/gb/ebwha/pdf_files/EB135/B135_3-en.pdf

3 Institute for Health Metrics and Evaluation (IHME). Global Burden of Disease Study 2015. Global Burden of Disease Study 2015 (GBD 2015) [Internet]. 2016. Available from: http://ghdx.healthdata.org/

4 Rose J, Chang DC, Weiser TG, Kassebaum NJ, Bickler SW. The role of surgery in global health: analysis of United States inpatient procedure frequency by condition using the Global Burden of Disease 2010 framework. PLoS One. 2014;9(2):e89693.

5 United Nations. The Sustainable Development Goals Report. United Nations. 2016;1–56.

SOA system and contribute significantly to safer care across the board, particularly at the district, regional and zonal hospital level. The total 7-year cost of implementation of this NSOAP is less than $2 USD per capita per year, equivalent to 3% of the current per capita health spend or 1.2% of the Abuja Declaration-recommended per capita health spend for Tanzania.

If the plan is fully implemented, the result will be a hospital in each zone providing a full range of specialist surgical services, significantly reducing the current burden on the national hospital and bringing care closer to patients and their families. Regional hospitals will be rehabilitated to provide safe, appropriately staffed and well-equipped core elective SOA service. Emergency SOA care at district hospitals will be made safer with more specialist staffing, a formal supportive supervision structure and standardised high quality training for ancillary clinical staff. In particular, anaesthesia care will be strengthened with anaesthesiology cover at Zonal, Regional and District level and a minimum one-year training for all anaesthesia providers. Overall specialist staff density will increase over 600% from 0.48 specialist SOA providers per 100,000 population to 3 specialist SOA providers per 100,000 population. Accountability and action around SOA care will be strengthened with stronger representation for SOA within MOHCDGEC and PORLAG and structured reporting lines all the way to the facility level. The actions of these new SOA teams will be directed and improved by robust data collected through core SOA indicators.

Service Delivery

The service delivery and systems organisation around SOA care is crucial to improving system efficiency. A 2008 study at Muhimbili National Hospital concluded that, of over 11,000 patients seen, 70% of patients had self-referred, having bypassed the district hospital level. Sixty-seven percent of these self-referred patients presented with surgical problems, and lack of expertise at the district hospital was cited as the reason for self-referral in 96% of these cases[6]. The critical issues in service delivery revolve around defining the expectations of each level of care and supporting a functional referral system for patients to move appropriately between care levels. Basic essential and emergency surgical care and stabilization of the critically unwell patient is prioritized at lower level facilities starting with CEmONC-upgraded health centres and district hospitals. In order to catalyse progress on the referral pathway, priority is given to strengthening comprehensive, emergency and elective surgical care at the zonal and regional hospitals so that they can act as hubs for referrals and provide supportive supervision for district and lower level facilities. Another key recommendation for service delivery is to designate “fully functional surgical centres” in zones which lack a zonal hospital and to ensure that they can offer the full range of SOA services expected at the zonal level. If each zone has a fully functional surgical centre, excessive patient referral can be minimised. As a result, pressure will be eased on the national hospital.

Infrastructure

Another major challenge addressed in the NOAP is the need to upgrade the infrastructure necessary to provide needed SOA services. In 2012, only 33% of health centres and 51% of hospitals which

6 Simba DO, Mbembati NAA, Museru LM, Lema LEK. Referral pattern of patients received at the national referral hospital: challenges in low income countries. East Afr J Public Health. 2008 Apr;5(1):6–9.

provided surgical care had the correct personnel and equipment to provide safe surgical services.[7] Limited diagnostic and laboratory service capabilities at many lower level facilities often leads to unnecessary referrals resulting in delays in receiving care and an ineffective use of resources. The maternal and child health community have made extraordinary progress is rehabilitating and upgrading facilities to provide CEMONC. The NSOAP recommends leveraging this investment to cost-effectively transform CEMONC sites into sites providing full basic emergency surgical care. By efficiently coordinating with existing efforts at the health centre level, resources can be channeled to improving care at the district, regional and zonal level. Particular care is taken, within the NSOAP, to strategize for the infrastructure required beyond the OR to support the patient through the perioperative course. This would include elements such as critical care, sterilisation services, diagnostic imaging, laboratory services and laundry.

Human Resource

Throughout the NSOAP process, the lack of human resources to provide SOA services and their inequitable distribution was unanimously identified as the single most pressing and important issue in improving SOA care in Tanzania. Currently, Tanzania's physician SOA density is 0.46 providers per 100,000 population. This falls significantly below the target of at least 20 SOA providers per 100,000 population recommended by LCoGS. The lack of providers is most acute in anaesthesia, with less than 20 practicing anaesthesiologists for a country of 50 million people. This problem currently has no sustainable solution as training is limited to two training centres with insufficient sponsorship to fill its places. The lack of a unified, recognised curriculum and certification for theatre nurses, critical care nurses and nurse anaesthesia providers is also a significant challenge limiting the provision of safe SOA care. The NSOAP aims to address these gaps by defining a strategic plan emphasizing expansion and standardization of training, employment and distribution of physician specialist cadres as well as allied health professionals. Training is prioritised for the first phase of the NSOAP implementation due to the significant lead time until graduation. Strengthening of supportive supervision models from higher to lower level facilities is also emphasised in order to improve safety at lower level facilities while the workforce is being expanded. Ongoing professional development for all cadres is also laid out in the plan.

Information management

Data around SOA services is severely lacking leading to challenges in advocacy and accountability around SOA care. The NSOAP recommends integration of basic surgical indicators into existing reporting structures and national dashboards as well as the development of a full monitoring and evaluation package. There is a recommendation to establish a monthly morbidity and mortality meetings at each facility to ensure that there is feedback and action from the data reporting. Planning around data escalation to international platforms and data sharing with the community is included.

Finance

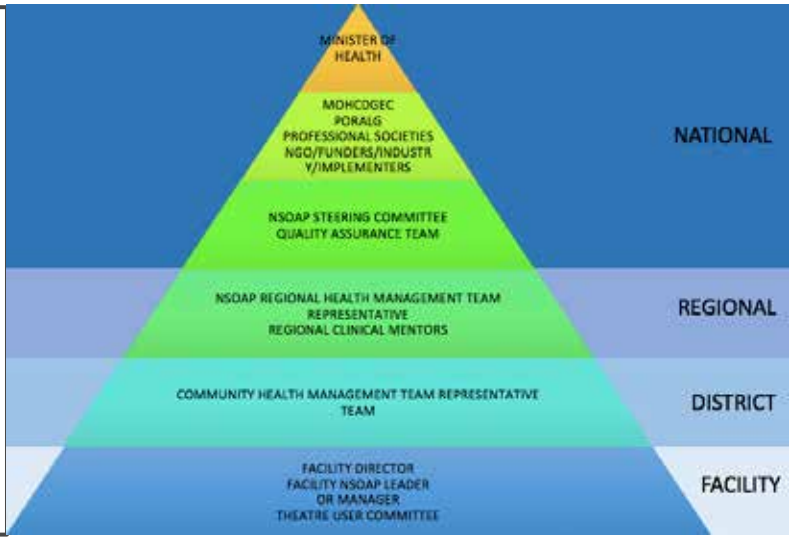
[7] Masanja H, Smithson P. Tanzania Service Availability and Readiness Assessment (SARA) 2012. 2013;(July):92. Available from: http://moh.go.tz/index.php/resources/downloads/category/18-monitoring-evaluation

Currently 85.5% of the population of Tanzania is at risk of impoverishing expenditure from seeking surgical treatment well below the target of 0% at risk by 2030 set by LCoGS. Financing of the NSOAP will require an inter-sectoral financial commitment from local, regional and national levels as well as from external partners. The plan lays out ways to advocate for existing and new funding sources and track the total investment in SOA care. It plans activities to improve costing information around SOA care which will allow these services to be meaningfully included within national insurance and universal health coverage packages.

Governance

As the first NSOAP for Tanzania, and only the third worldwide, a great deal of effort will be required to establish the policy and political architecture required for visibility and accountability around the advancement of SOA services. The NSOAP's first phase of implementation recommends a significant proportion of resources be spent on developing the required committees, representatives and reporting structures required for a functional SOA system. A recommended governance structure is suggested in Figure I.

Figure I: Recommended governance structures to strengthen NSOAP visibility and accountability



Cost

Costing was led by representatives from across the MOHCDGEC and the SafeSurgery2020 initiative. A summary of costs can be found in Table I. The total 7-year cost of implementation of this NSOAP is less than $2 USD per capita per year, equivalent to 3% of the current per capita health spend or 1.2% of the Abuja Declaration-recommended per capita health spend for Tanzania compared with a surgical burden being 17% of all DALYs in Tanzania. As the majority of measures within the plan are cross cutting in strengthening the health system, the spend will see an impact far beyond just SOA care.

Domain	Implementation cost per Fiscal Year (Costs TZS; 1000s)							Cost per domain (TZS)	Cost per domain (USD)
	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25		
Service Delivery	644,348	940,209	2,271,394	2,733,400	2,947,029	3,190,844	3,713,424	17,244,941	7,691,767
Infrastructure	14,144,242	75,529,387	162,062,015	143,113,859	111,459,714	95,134,276	17,362,174	618,805,668	276,006,096
Human Resource	25,348,207	32,445,908	43,063,465	55,551,415	62,112,857	72,751,255	94,880,662	386,153,769	172,236,293
Information Management and Technology	1,172,071	3,848,739	2,702,933	3,549,224	2,565,856	3,561,152	2,680,111	20,080,087	8,956,328
Finance	183,895	776,885	268,385	251,885	72,535	251,885	72,895	1,878,365	837,808
Governance	470,514	347,520	389,149	383,124	383,124	347,520	435,514	2,773,251	1,236,954
Total (TZS)	41,963,277	113,888,648	210,757,341	205,582,908	179,541,116	175,236,931	119,144,781	1,046,936,080	466,965,245
Total (TZS) @ 7.5% inflation	41,963,277	122,430,296	243,556,452	255,395,004	239,771,620	251,575,278	183,876,322	1,338,568,247	
Total (USD) @ 7.5% inflation	18,716,894	54,607,625	108,633,565	113,913,918	106,945,415	112,210,204	82,014,417	597,042,037	

Table I: Summary of NSOAP implementation costs (2017 TZS and USD)

Chapter 1: Introduction

The National Surgical, Obstetric and Anaesthesia Plan (NSOAP) presented here was developed by the Ministry of Health, Community Development, Gender, Elderly and Children (MOHCDGEC) in partnership with the President's Office, Regional Administration and Local Government (PORALG) and the Safe Surgery 2020 (SS2020) initiative.

Global Surgery has garnered much attention worldwide in recent years. This is in part due to the publication of the Lancet Commission on Global Surgery (LCoGS)[8] which stated that five billion people in the world do not have access to safe, affordable and timely surgical care when needed. The World Health Assembly Resolution 68.15 passed shortly after the LCoGS, recognized the critical role of surgical care provision in achieving Universal Health Coverage (UHC) by 2030 and also highlighted the key role for surgery in ensuring health care for all. In recognition of the need to improve access to safe, timely and affordable surgical care in Tanzania, the MOHCDGEC embarked on the development of the NSOAP presented here. This NSOAP evaluates the current situation of the surgical systems in Tanzania and sets a clear roadmap for improving access to SOA care for all Tanzanian citizens.

The document was developed through a coordinated, transparent and participatory multi-stakeholder process which included representatives from the MOHCDGEC, PORALG, professional societies, Non-governmental Organizations (NGO's), the private sector and development partners. The process began in November 20116 with a situational analysis that included the gathering of all existing relevant information on the surgical system in Tanzania. This situational analysis included a review of existing MOHCDGEC policies and available data from HMIS, a literature review of published scientific articles and NGO reports, and semi-structured interviews with stakeholders involved in the Tanzanian surgical ecosystem. Information from the situational analysis was then synthesized into policy briefs and terms of reference to inform discussions around priority areas in the NSOAP.

In the next phase of this development process, five Technical Working Groups (TWG), developed around the six NSOAP domains, were convened, by the MOHCDGEC in April 2017. The Technical working groups discussed the strategic objectives and milestone targets, agreed on evidence-based interventions, and deliberated on activities to be included in the NSOAP.

In October 2017, a two-day NSOAP writing workshop was convened with representatives from each TWG to review the first draft of the NSOAP. The committee formed from this writing workshop reviewed and agreed on the strategic objectives, outputs, activities, indicators and targets presented in this NSOAP.

In the final phase of NSOAP development, the activities described within the NSOAP were costed for implementation over the NSOAP timeframe by a team consisting of the NSOAP steering committee, health policy and planning experts from MOHCDGEC, and relevant stakeholders. This occurred in November 2017.

In this NSOAP, relevant Government of Tanzania (GoT) development priorities as stated in the Big Results Now (BRN) and MOHCDGEC's National Health Policy and Health Sector Strategic Plan (IV) have been incorporated. Additionally, other pre-existing pertinent MOHCDGEC strategic plans and policy guidelines have been integrated into this NSOAP.

[8] Meara JG, Leather AJ, Hagander L, et al. Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development. Lancet 2015;386:569–624

The NSOAP begins with background information on Tanzania and revisits relevant national and MOHCDGEC policies (chapter 2). It then follows with a thorough situational analysis of the current Tanzanian surgical, anaesthesia and obstetric ecosystem in Chapter 3. In chapter 4, a rationale for the NSOAP is presented. The mission and vision of the NSOAP are then presented in chapter 5 followed by the strategic objectives, outputs and activities in chapter 6. The monitoring and evaluation plan is presented in chapter 7 and Chapter 8 states the governance framework. Chapter 9 outlines the dissemination and advocacy plan. Finally, chapter 10 costs the activities to be implemented in the NSOAP.

Chapter 2: Background

The United Republic of Tanzania is located in East Africa on the coast of the Indian Ocean and covers a geographic area of 940,000 square kilometres, of which 60,000 is inland water. The country is bordered by Kenya and Uganda to the north, Rwanda, Burundi and Democratic Republic of Congo to the west, Zambia and Malawi to the southwest and Mozambique to the south. The main water bodies include Lake Victoria, Lake Tanganyika and Lake Nyasa. Tanzania has of population of 55.6 million people[9]. In 2016, the country Gross Domestic Product (GDP) at current prices was USD 47.4 million and the per capita GPD was USD 879.2[2]. The death rate is 732.3 per 100,000 population[10].

On 9 December 1961, mainland Tanzania, formerly Tanganyika, gained independence from British colonial rule. Following the overthrow of the sultanate rule, Zanzibar gained independence on 12 January 1964 and united with Tanganyika to form the United Republic of Tanzania on 26 April 1964.

Table 1. Demographics and Socio-economic indicators

Indicator	Status	Source
Population (millions)	55.6	World Bank, 2016
GDP per Capita	879.2 (USD)	World Bank 2016
Sex ratio (Males per 100 Female)	95	NBS, 2012
Population Growth Rate (annual %)	3.1	World Bank, 2015
Life Expectancy at Birth (years)	65	World Bank, 2015

The Tanzania Vision 2025 was developed in 1998 as clear vision for the country on how to attain long-term development. The health sector is prioritized in Vision 2025, as one of the key focus areas required to attain the goal of attaining high quality livelihoods for Tanzanian citizens.

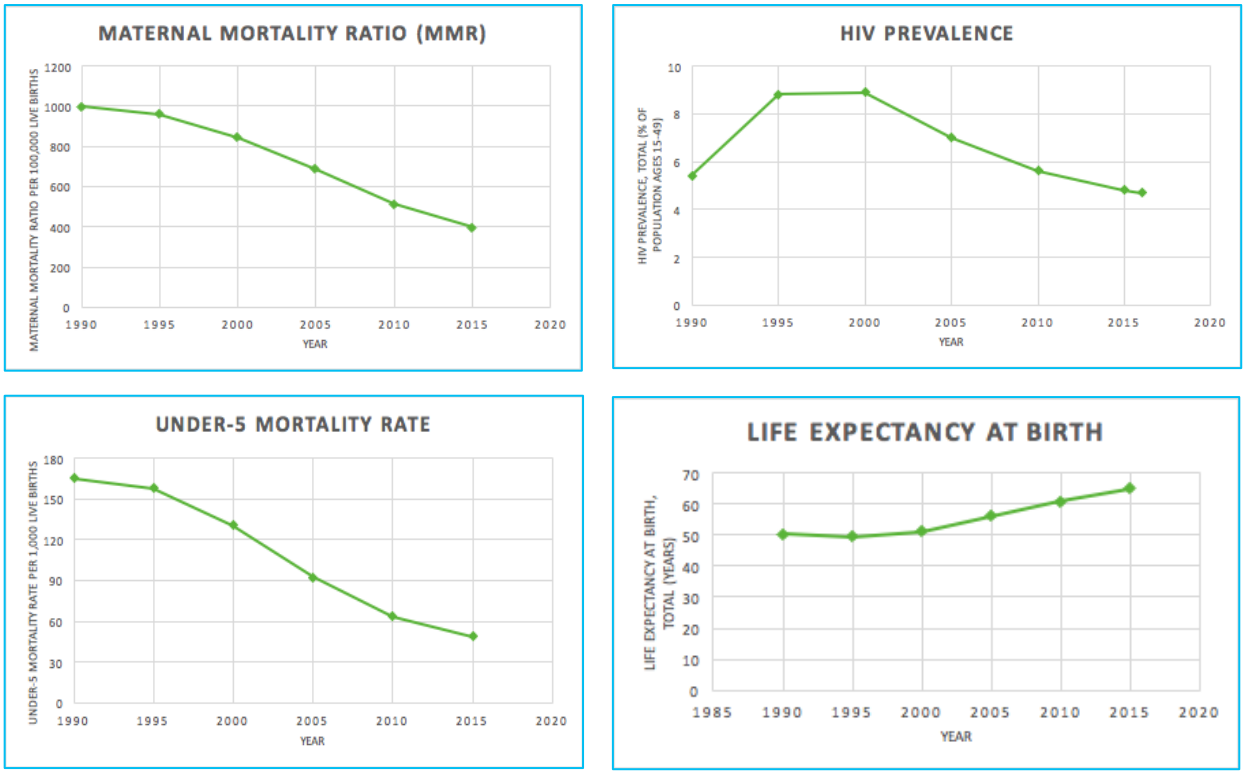
Health Sector Strategic Plan IV

Guided by the priorities set by the Vision 2025, BRN, the National Health Policy, the Sustainable Development Goals (SDGs), and previous versions of the Health Sector Strategic Plan (HSSP), HSSP IV 2015 – 2020 was developed with the overall objective of reaching all households with essential health and social welfare services, to meet, as much as possible, the expectations of the population, adhering to objective quality standards, and applying evidence-informed interventions through efficient channels of service delivery.

[9] World Bank, 2016. "World Development Indicators"

[10] Institute for Health Metrics and Evaluation (IHME), 2015, "Tanzania Country Profile," healthdata.org

Figure 1. Major trends in world development health indicators for Tanzania

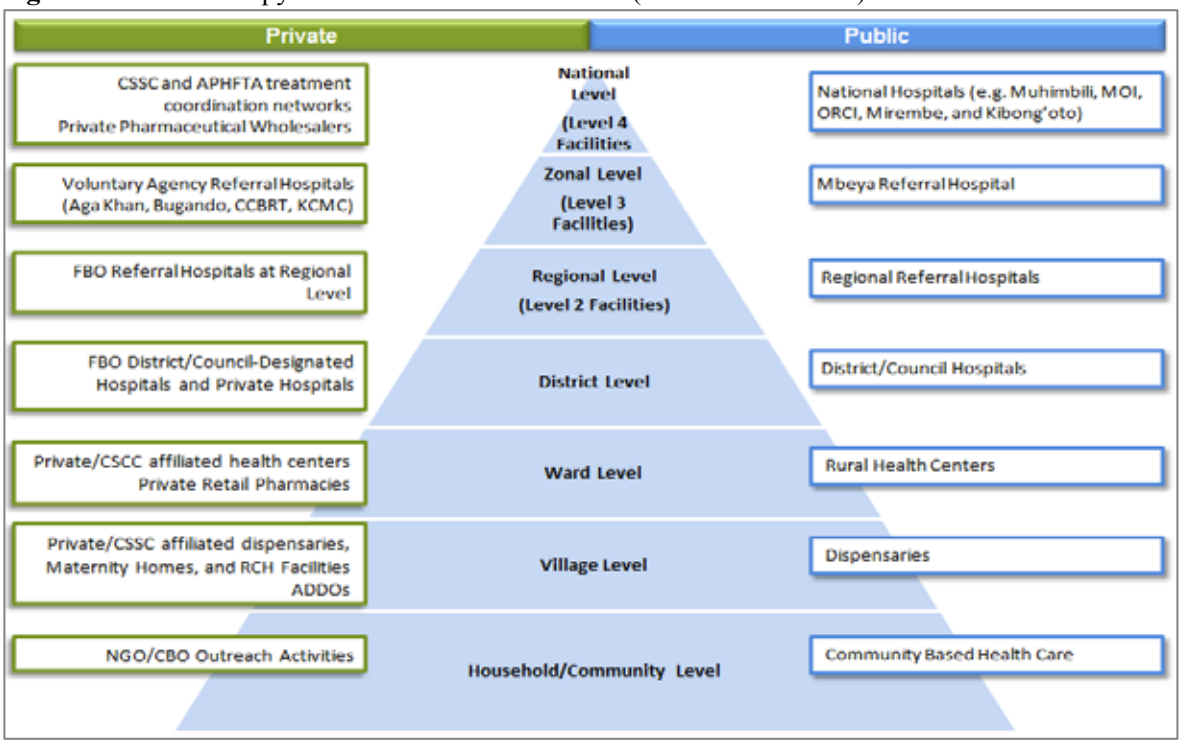


Organization and Management of Health Care System in mainland Tanzania
MOHCDGEC and PORALG are responsible for delivery of public health services in Tanzania Mainland. PORALG –Department of Health- manages and administers public health services at regional and council levels. MOHCDGEC defines priorities for the health sector, offers technical guidance to organizations involved in service delivery, defines, controls and promotes maintenance of quality standards and sets policies for health care delivery.

Figure 2 outlines the basic structure of the Tanzanian health care delivery system. Community-based preventative and curative services are provided at dispensaries and health centers. A proportion of health centers are equipped to admit patients and provide minor and some major surgical procedures. District hospitals provide medical and surgical services for patients referred from lower levels facilities. Regional referral hospitals provide more specialized medical and surgical care while Zonal and National hospitals are capable of offering more advanced medical and surgical care. Zonal and National hospitals often serve as teaching hospitals[11].

[11] MOHCDGCEC, 2015, Health Sector Strategic Plan IV,

Figure 2. Health care pyramid in Tanzania Mainland (Public and Private)



Source: Health Sector Strategic Plan IV

Chapter 3: Situational Analysis

1. Tanzania's Healthcare System

The GoT has made significant progress in providing health services to its citizens through an increase in public and private providers. The total number of health facilities in the country has increased from 6,321 in 2010 to 7,519 in 2015. These facilities are divided into 252 hospitals, 718 health centers and 6,549 dispensaries (including 89 clinics).

2. Disease Burden

Communicable diseases like HIV/AIDS, malaria, lower respiratory infections and diarrheal disease remain the main causes of mortality. However, the incidence of non-communicable diseases (NCDs) is on the rise and becoming a major contributor to mortality and morbidity.

Non-communicable Diseases are estimated to account for 31% of total deaths in Tanzania[12]. Cardiovascular diseases, ischeamic heart diseases and congenital heart disease are among the top causes of death. Although surgery is responsible for approximately 65% of all cancer cure and control[13], access to surgery is limited for cancer patients in Tanzania. Additionally, despite the elevated incidence of traumatic road injuries, the capacity to treat victims is limited in most parts of the country especially in rural regions.

Maternal Mortality reductions have been made. The 2012 Maternal Mortality Ratio (MMR) was 432 per 100,000 live births, down from 454 per 100,000 live births in 2010 and 870 per 100,000 live births in 1990. However, despite this 47% reduction of MMR between1990-2014, MMR remains relatively high as Tanzania failed to achieve Millennium Development Goal 5 (MDG5) which had as a target reducing MMR by three quarters between 1990 and 2015.

It is currently estimated that 70% of maternal deaths in Tanzania are obstetric related[14]. The MOHCDGEC's National Roadmap Strategic Plan to Improve Reproductive, Maternal, New-born, Child & Adolescent Health (One Plan II), aims to increase coverage of CEmONC services from its current 9% at upgraded health centers and 73% at hospitals to 50% and 100% respectively by 2020.

3. Service Delivery

Although service delivery is improving in Tanzania, many challenges remain in surgical, obstetric and anaesthesia care delivery. The LCoGS recommends 80% coverage of essential surgical and anaesthesia services by 2030. Currently, Tanzania significantly lags behind this target with an unknown proportion of its population having access to essential surgery and anaesthesia care. Across the country, the surgical care that is provided is often limited to essential life-saving and emergency surgical procedures and it is inadequate to provide services to all citizens. Of the total number of health facilities operating in the country, 18% of health centers, 100% of district hospitals, 82% of regional hospitals and 86% of zonal, national or specialized hospitals provide major surgical services (Table 2). In 2012, only 27% of dispensaries, 33% of health centers and 51% of hospitals which provided surgical care had the correct personnel and equipment to provide safe surgical services[15].

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[12] World Health Organization, Non-communicable Diseases (NCD) Country Profile, 2014

[13] Dare AJ, Anderson BO, Sullivan RS, et al. Surgical services for cancer cure. In: Disease control priorities, 3rd edn. Cancer. Washington, DC: World Bank

[14] MOHCDGEC, One Plan II

[15] Ministry of Health and Social Welfare, Tanzania Service Availability and Readiness Assessment (SARA), 2012

Table 2. Number of facilities providing major surgical care

Health Facility Level	Number of facilities providing major surgical services	Total Number of Facilities	Percentage
Zonal, National, or Specialized	6	7	86%
Regional hospitals	18	22	82%
District hospitals	85	85	100%
Health Center	104	586	18%
Dispensary	72	4,249	2%
Other or Unspecified	82	95	86%
Total	367	5,044	7%

Source: Health Management Information System, MOHCDGEC

Additionally, the current distribution of surgical services is inequitable with limited availability in rural areas where a majority of the population resides. Therefore, the expansion and equitable distribution of SOA services throughout the country is crucial for ensuring that all Tanzanians have access to safe surgical services.

Surgical Referral System

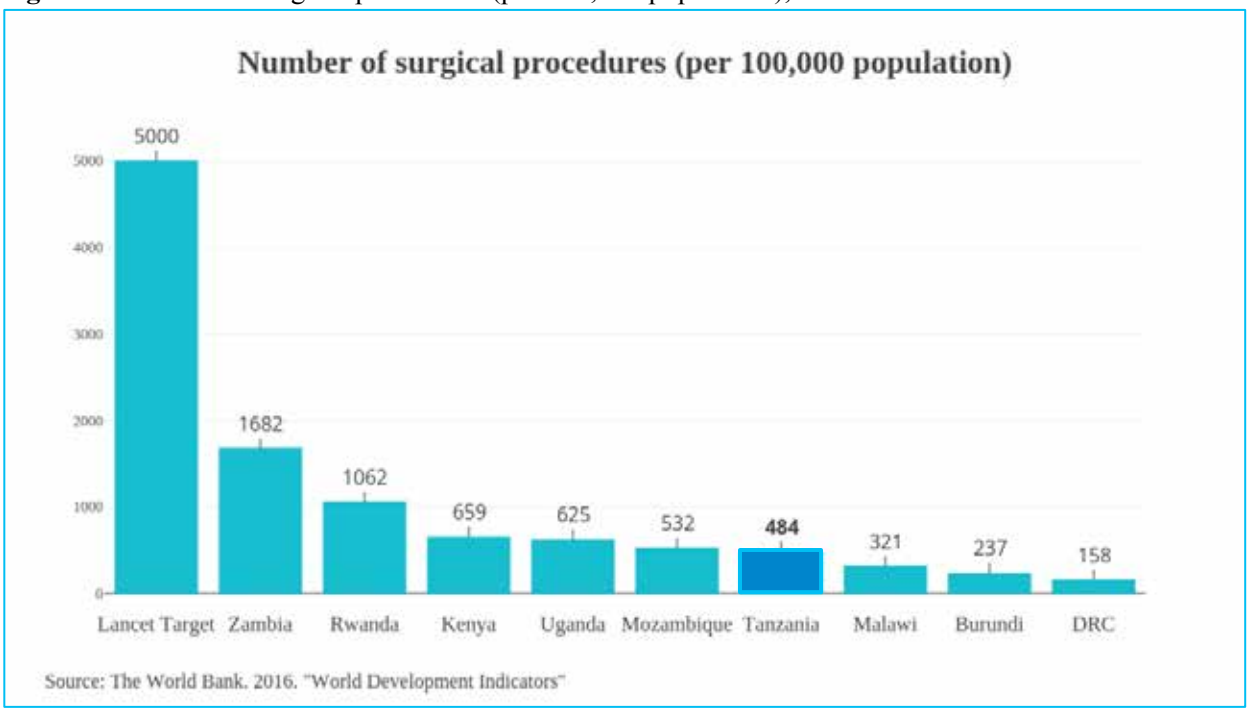
Inefficiencies in the surgical referral system often lead to delays or cancellations in service provision. Referrals that are inappropriate stem from an inability to effectively diagnose and treat patients at lower-level facilities like dispensaries, health centers, and district hospitals. Stakeholder consultation and a review of published literature revealed the following as the most common reasons for inefficiencies in the referral system:

- Critical shortage of trained health workers at lower level facilities
- Absence of or irregular supply of essential diagnostic and treatment infrastructure, equipment, medications, supplies, and blood
- Lack of efficient patient transportation systems
- Lack of communication systems between referring and referral hospitals, preventing clinicians at lower level facilities from performing effective hand-offs, and preventing clinicians at referral facilities from providing feedback on appropriate and inappropriate referrals
- Poor communication among hospitals in the same region to maximize the utilization of existing skills and facilities and promote horizontal referrals, particularly between public and private hospitals

These inefficiencies often result in patient self-referrals, leading to overcrowding and resource constraints at the "target" referral level hospitals. To address the challenges of surgical service delivery, it is important to overcome the inefficiencies of the referral system. Without a comprehensive approach to fixing the challenges of the referral system, mortality and disabilities arising from surgically-treatable conditions will not be reduced and Tanzania will fail to meet the recommended target of 5,000 surgical procedures per 100,000 population[16] by 2030 (Figure 3).

[16] Meara JG, Leather AJ, Hagander L, et al. Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development. Lancet 2015;386:569–624

Figure 3. Number of surgical procedures (per 100,000 population), East African Countries



4. Human Resources

Human resources are the backbone of SOA care provision and deficiencies in human resources for SOA leads to poor access to quality surgical services. Human Resource challenges in providing SOA care in Tanzania include the following:

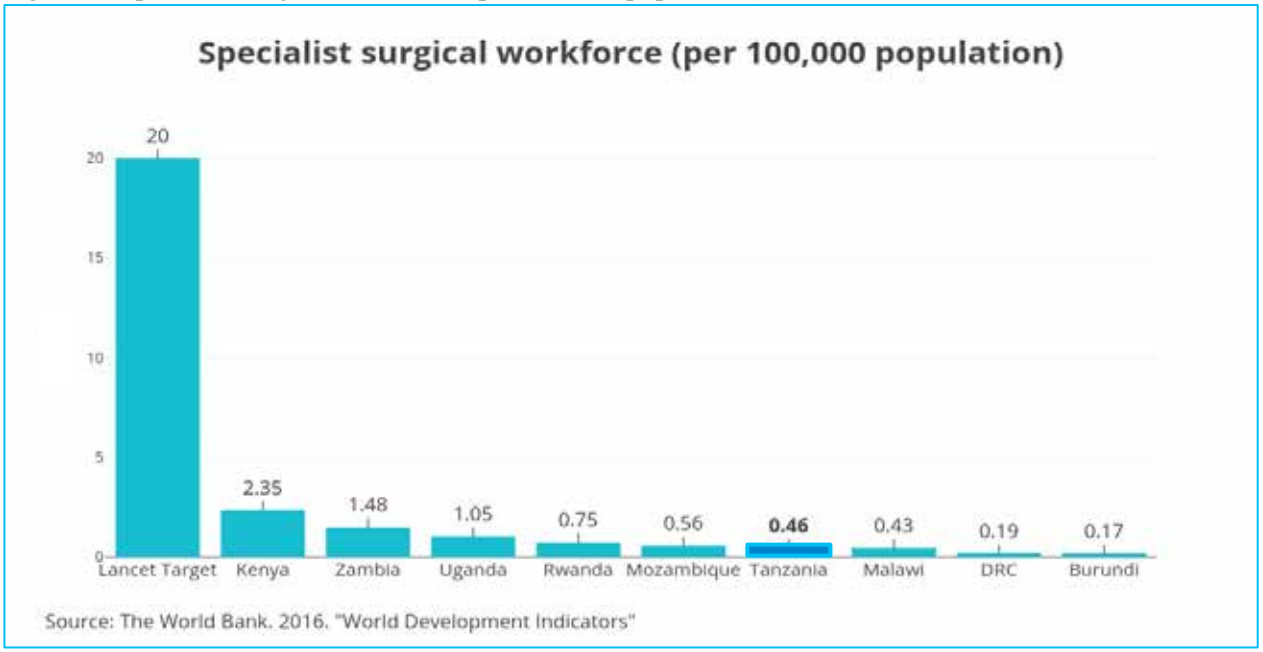
- Shortage in surgical and obstetric providers
- Critical shortage of anaesthesia providers
- Inequitable distribution of current SOA providers with very few SOA providers in rural regions
- Insufficient SOA education and training programs
- Low unemployment rates and low retention of trained SOA providers
- Limited Continuing Medical Education (CME) and Continuing Professional Development opportunities for practicing SOA providers
- Insufficient supervision and support of SOA task-sharing workforce

Currently, Tanzania's physician SOA density is 0.46 per 100,000 population, which falls significantly below the threshold of at least 20 SOA providers per 100,000 population recommended by LCoGS. Although the rural population accounts for over 70% of the population in Tanzania, many hospitals across the country have no permanent surgical, medical, or anesthesiology specialists. A recent assessment of 20 hospitals in the northern Zone of Tanzania showed that at all twenty sites surgical care was provided exclusively by non-specialists and anesthesia care was the most lacking with no anesthesiologists and only one AMO anesthetist across all 20 sites.[17] In many hospitals, formal speciality training for emergency or critical care is inadequate. Poor access to anaesthesia, due to the lack of anaesthesiologists across the country, is the most frequently cited challenge amongst stakeholders, with reports of no anaesthesiologists in district and regional hospitals across the

[17] SURGAfrica Tanzania Situational Analysis, 2018

country. Tanzania only has 0.05 physician anaesthesiologists per 100,000 population and 0.15 anaesthesia providers of any type per 100,000 population[18,19].

Figure 4. Specialist surgical workforce (per 100,000 population), East African Countries



Allied Health professionals play an integral role in the provision of surgical care. This integral network of supporting staff includes, but is not limited to, theatre managers, nurses, biomedical technicians, radiologists, community health workers, hospital managers/administrators, laboratory technicians, pathologists, associated physicians and task-shifters. Currently these allied health professionals experience numerous challenges in terms of their availability, quality of services provided, employment and retention. Acknowledging the crucial role these allied health professionals and their current shortage is important and they should be supported.

It is therefore, imperative to address the surgical human resource deficiencies to ensure that all citizens have access to safe surgical, obstetric and anaesthesia care when needed. Addressing these challenges will ensure that Tanzania attains the recommended LCoGS target of 20 specialist SOA providers per 100,000 population (Figure 4).

5. Infrastructure, Equipment and Supplies

The provision of safe surgery, anaesthesia and obstetric services is heavily dependent on the availability of optimally functioning infrastructure, equipment and supplies. Currently, throughout the country there are significant shortages in these three domains that must be addressed to improve the quality and volume of SOA services for Tanzanian citizens.

Infrastructure

As of 2017, there are 5,044 health facilities in Tanzania, 367 of which are reported to be able to provide major surgical procedures. However, many of these facilities experience infrastructure challenges that prevent them from providing surgical care that is optimal for their catchment

[18] Dubowitz G, Twagirumugabe T, Lugazia E, Epiu I, Ndarugirire F, Mijimbi C, et al. Anaesthesia in developing countries. Value in Health. 2015;18(7):A679

[19] Dubowitz G, Twagirumugabe T, Lugazia E, Chokwe TM, Epiu I, Mijumbi C, et al. Challenges of Anesthesia in Low- and Middle-Income Countries: A Cross-Sectional Survey of Access to Safe Obstetric Anesthesia in East Africa. Anesthesia and Analgesia. 2017;124(1):290-9.

populations. It is currently estimated that only 22% of hospitals have the basic infrastructure to provide emergency surgical care[20].

Access to basic utilities such as clean water and electricity necessary for surgical procedures is also a challenge. Currently, it is estimated that only 52% of all hospitals have a reliable water source[21]. A 2018 report of 20 hospitals providing surgery in the Northern Zone reported 82% to have a water supply.[17]A dependable patient transportation service, crucial to the efficiency of a referral system, is also in need of strengthening. Access to ambulances is limited due to poor availability, limited funds for repair and maintenance, misuse, and lack of coordination of the dispatch system. Morbidity and mortality from surgical conditions are therefore compounded by an inadequate transportation system.

Equipment

Access to surgical equipment is inadequate across Tanzania, and when available, it is often outdated, or dysfunctional due to a lack of maintenance and inability to obtain spare parts. Available data in the Health Facility Registry indicates that only about half of the health facilities providing major surgical procedures have access to blood transfusion services, CEmONC equipment, ultrasound, Computerized Tomography (CT) Scanners, Magnetic Resonance Imagining (MRI) and X-ray machines. In 2014, there were only two MRI machines, and six CT scanners in the country[22]. Basic essential life-saving equipment such as anaesthesia machines and pulse oximeters is also in limited supply in Tanzanian health facilities. Common equipment challenges in providing SOA care identified by stakeholders include the following:

- Shortage of anaesthesia machines and oxygen supply especially at health centers, district and regional hospitals
- Inadequate equipping of health facilities to provide SOA care required at their level
- Poor maintenance and repair schemes for infrastructure
- Outdated surgical equipment guidelines
- Limited number of ambulances for transportation

Access to surgical equipment is crucial for performing surgeries safely and thus should be prioritized in any efforts to expand and strengthen SOA services. A strategic approach should be taken to equipping health facilities to ensure that each facility has the appropriate equipment to provide surgical care at its required level.

Supplies and Consumables

The Medical Stores Department (MSD), operated by the MOHCDGEC, is in charge of supplying medication and medical supplies to public health facilities throughout Tanzania. A Tanzanian National Audit Office report conducted from 2010-2013 found significant challenges in demand forecasting and distribution of essential medicines and medical supplies. Challenges identified included delays in processing and delivering orders, ineffectiveness of needs assessments at facilities, and high levels of stock-outs at warehouses. Only about 11% of orders from health facilities to zonal warehouses were submitted on time. The audit found that 96% of hospitals reported being out of stock of one or more essential medicines and 94% hospitals lacked one or more essential medical supplies. An estimated 52% and 59% of hospitals lacked essential medicines and supplies, respectively, for more than four weeks. A report from Northern zone from 2018 showed only 64% of centers providing surgery had reliable access to suture, gowns or sterile dressings. Challenges in MSD are reportedly compounded by delays in the release of funds from the Ministry of Health.

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[20] Stafford RE, Morrison CA, Mahalu W, Godfrey G. Challenges to the provision of emergency services and critical care in resource-constrained settings, 2014

[21] Gupta S, Kushner AL, Stewart BT, Onchiri FM, Habermann EB, Chawla SS. Water availability at hospitals low- and middle-income countries: implications for improving access to safe surgical care. Journal of Surgical Research. 2016

[22] World Health Organization, Global Atlas of Devices 2014

6. Information Management and Technology

Data collection, analyses, synthesis and reporting is crucial to a well-functioning healthcare system. Access to data on the surgical system allows for a better understanding of the strengths and gaps of the SOA system. Reliable data is vital for the development of evidence-based policies to improve the SOA ecosystem at the population and facility level.

Currently, Tanzania faces numerous challenges in the collection and reporting of surgical data at the national and facility level. At the National Level, tracking of surgical information through the Health Management Information System (HMIS) is scant. HMIS currently collects only limited SAO indicators. These include the following:

- Human resource by district and region
- Facilities providing major and minor surgeries
- Facilities with blood transfusion services
- Facilities with diagnostic capabilities including X-ray, CT scan, MRI and ultrasound machines
- Facilities providing Caesarean section procedures

However, these indicators are insufficient and limited in scope to adequately inform national policies and facility decision making on SOA care. At the moment, none of the six recommended LCoGS indicators are routinely collected at the facility and national levels.

The MOHCDGEC's *Quality Improvement Strategic Plan 2013-2018,* outlines the its commitment to improving health outcomes for patients through tracking key quality improvement indicators. However, only one of these key indicators directly relates to surgery, namely *percentage of patients who were informed on procedures, possible risk and alternative treatment option prior to surgical procedure*. While this indicator is useful, this nonetheless highlights the paucity of key indicators for quality improvement purposes in safe SOA care provision.
At the facility level, health information is collected in Mtuha books, paper registries collating key statistics at the facility level. Surgical data collection, storage and analysis remains a challenge at the facility level as most hospital records are paper-based and analysis of collected data is often not performed. A majority of the facilities collect patient data related to admissions, procedures performed, discharges and death before discharge. Collecting mortality and morbidity patient data remains a major challenge due to loss to follow-up.

In 2013, the Ministry of Health and Social Welfare (now the MOHCDGEC) developed the Tanzania National e-Health Strategy to address some of the challenges of the Health Information System through Information and Communications Technology (ICT). Some of the challenges in Health Information System (HIS) identified at that time included:

- Lack of coordination of ICT among ministries, departments and agencies, as well as with partners
- A fragmented landscape of e-Health pilot projects and stakeholders
- Numerous data and HIS silos
- Lack of ICT infrastructure
- Lack of ICT workers, particularly those who are well trained.

All of these challenges in HIS persist today and are especially relevant for surgical HIS which has been in the shadows. The strengthening of national policies aimed at improving HIS, such as the eHealth Strategy, will be necessary for ensuring access to the high quality data that will be required for elevating the Tanzanian SOA ecosystem. It is equally fundamental that SOA indicators be incorporated and tracked on current platforms.

7. Finance

Cost-effectiveness analyses have shown that investing in surgery is comparable to interventions such as antiretroviral therapy for HIV and bed-nets for malaria. Cost-benefit analyses have equally demonstrated that the economic benefits of surgical procedures like Caesarean sections and cleft lip surgeries significantly outweigh their costs[23]. However, the proportion of the GoT's health budget that is annually allocated to surgical care is currently unknown.

Some common financial challenges limiting SOA care provision identified by stakeholders included:

- Insurance packages do not fully reimburse hospitals for the full costs of surgical procedures which often financial constraints of hospitals providing surgical services
- Providing free surgical services to patients without insurance who cannot afford out-of-pocket payments without sufficient compensations for those services often puts financial constraints on public institutions providing these services.
- Surgical infrastructure and human resource scale-up is limited by budget constraints at the facility and national levels

The cost of seeking care is known to delay seeking care and often a major factor in the decision not to seek care at all. Patients' out-of-pocket costs for surgery often varies by the level of the facility, and type of facility (private, public or faith-based). The high degree of dependence on out-of-pocket payment is widely recognized to be a major cause of inequities in access to health care, and also constitutes a high degree of financial risk for households across Tanzania. It is estimated that the risk of catastrophic and impoverishing expenditures from seeking surgical care is 65.8% and 85.5% respectively (Figure 5 and 6). Mitigating the risk of catastrophic and impoverishing expenditures for patients seeking surgical care is therefore crucial for achieving poverty level goals set in Vision 2025 and the SDGs.

[23] Chao TE, Sharma K, Mandigo M, Hagander L, Resch SC, Weiser TG, et al. Cost-effectiveness of surgery and its policy implications for global health: a systematic review and analysis. Lancet Glob Health. 2014

Figure 5. Risk of impoverishing expenditure for surgical care (% of people at risk), East African Countries

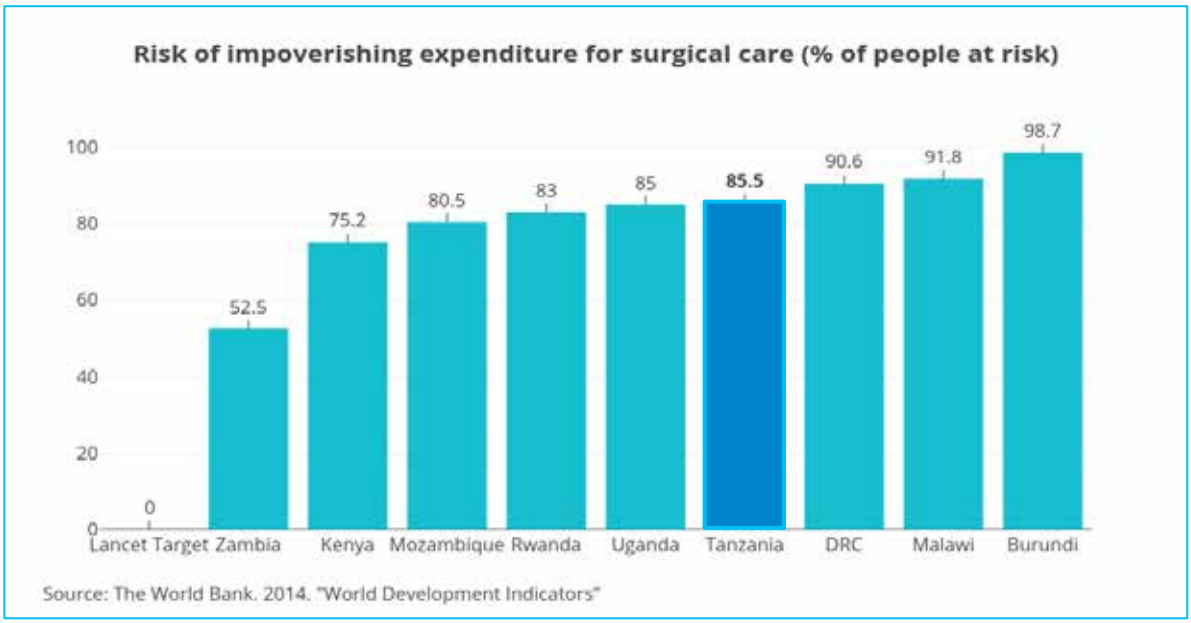
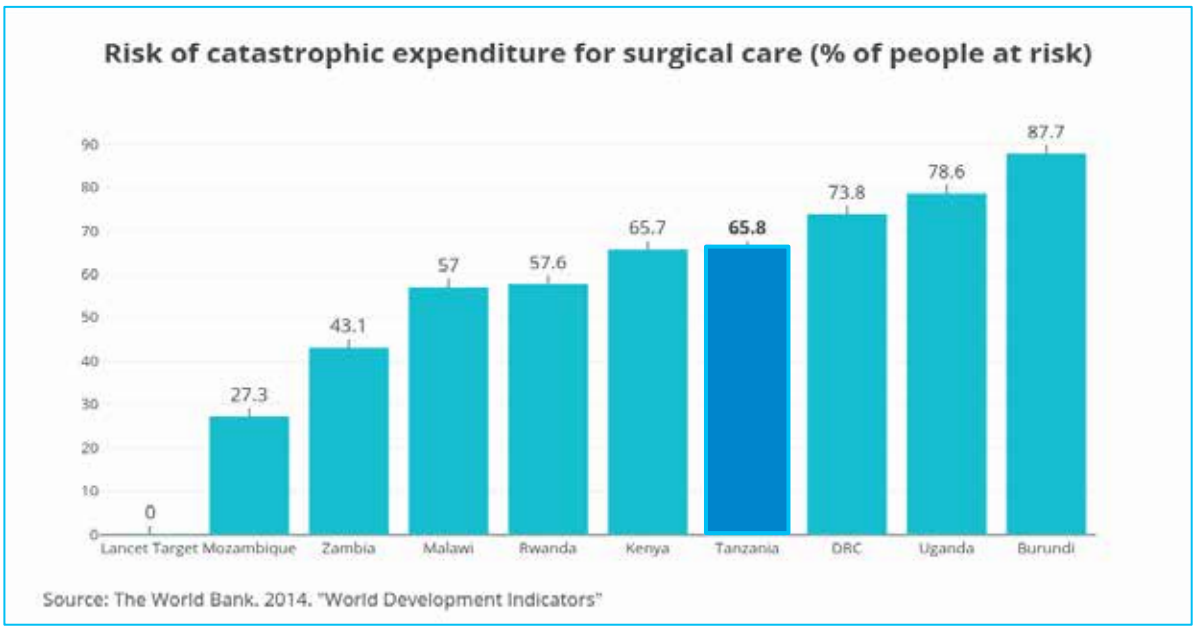


Figure 6. Risk of catastrophic expenditure for surgical care (% of people at risk), East African Countries



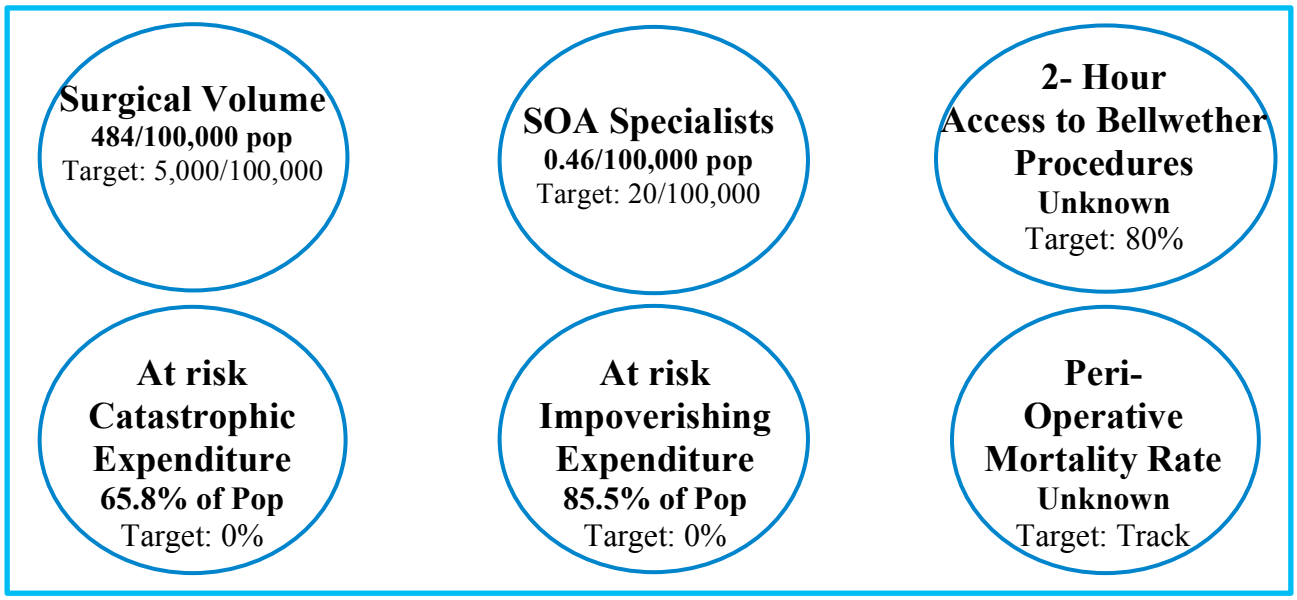
Chapter 4: Rationale for the National Surgical, Obstetric and Anaesthesia Plan

In April 2015 the Lancet Commission on Global Surgery created released findings on the current global condition of surgery in a report entitled *Global Surgery 2030*[24]. The report showed that the majority of the world's population – **5 billion people** – do not have access to safe, affordable, and timely surgical, anaesthesia, and obstetric care. 143 million more procedures are needed worldwide each year to meet the gap between available and necessary procedures, and at least 25% of patients who do receive surgery are financially impoverished as a result. The Commission also found that the economic losses from the burden of surgical illness amounted to almost **2% of GDP** in low and middle-income economies, highlighting that investment in surgery, obstetric and anaesthesia care promotes economic growth and welfare.

Beyond simply presenting the problems, *Global Surgery 2030,* for the first time in the field of public health, laid out a pathway for countries to achieve universal access to safe, affordable and timely surgical care. That pathway would include over 100 concrete recommendations across five domains. Included among these was the recommendation that the global community focus on six, easy-to-collect but powerful indicators of surgical system strength:

- Proportion of the population living within 2hrs of a facility able to provide Bellwether emergency surgical procedures (C-section/laparotomy/open fracture repair)
- Procedure volume per 100,000 population
- Peri-operative Mortality Rate
- Density of specialist Surgery, Anaesthesia, Obstetric professionals per 100,000 population
- Proportion of the population at risk of impoverishing expenditure in accessing surgical care
- Proportion of the population at risk of catastrophic expenditure in accessing surgical care

Figure 7. The 6 WDI/Lancet indicators for Tanzania



[24] Meara JG, Leather AJ, Hagander L, et al. Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development. Lancet 2015;386:569–624

Surgery requires a complex ecosystem of care including surgery, obstetrics, anaesthesia, allied health and management professionals and the institutions that connect them. Vertical disease-specific programs will not make the impact required to improve surgical services. To assure a coordinated approach to surgical system strengthening, governments will need a broad-based collaborative effort to improve surgical systems. The Lancet Commission recommended that governments undertake a process of National Surgical Planning. The national surgical plan would be based on five interconnected domains: (1) infrastructure (2) workforce (3) service delivery (4) information management and (5) financing. The plan would delineate current challenges, long term goals and achievable targets over the plan's cycle alongside recommendations for practical solutions.

In Tanzania, 19.3% of deaths and 17 % of Disability-Adjusted Life Years (DALY) are attributable to diseases amenable to surgery[25]. Tanzania lags behind its regional neighbours in surgical capacity as assessed by the World Development Index surgical indicators and Lancet surgical indicators (Figures 3-6)[26]. In recognition of the clear need to strengthen quality and access to surgical services in Tanzania, the MOHCDGEC embarked on the process of developing a National Surgical, Obstetrics and Anaesthesia Plan (NSOAP) based on recommendations from *Global Surgery 2030*.

The NSOAP also aligns with current efforts by the MOHCDGEC, PORALG and its implementing partners in their efforts to improve healthcare outcomes in Tanzania. It supports existing policy priorities of the MOHCDGEC as outlined in the *Health Sector Strategic Plan IV*.

[25] Global Burden of Disease Study 2015. Global Burden of Disease Study 2015 (GBD 2015) Results. Seattle, United States: Institute for Health Metrics and Evaluation (IHME), 2016.
[26] World Bank, 2016. World Development Indicators 2016.

Chapter 5: Vision and Mission

1. Vision

All Tanzanians live healthy and productive lives.

2. Mission

By 2025, ensure access to safe, affordable and timely surgical, anaesthesia and obstetrics services for all Tanzanian citizens.

Chapter 6: The 6 domains: Strategic Objectives, Outputs and Activities

The NSOAP is divided into six core domains: (1) Service delivery (2) Infrastructure (3) Human Resource (4) Information management and technology (5) Finance and (6) Governance. Under each domain are several strategic objectives which describe what the NSOAP is aiming to achieve. Each strategic objective is further divided into outputs which describe the expected result of the NSOAP. The activities attributed to each output are the items to be implemented to achieve the specific output. Each output has an indicator, a quantifiable benchmark of progress towards achieving the output, and a target which is the desired NSOAP goal for each indicator.

1. Domain 1: Service Delivery

SO 1.1 Ensure the equitable distribution of SOA services throughout Tanzania from health center to national levels

Rationale:
Not all surgical procedures must be offered at all levels of care. Centralisation of some surgical procedures has been shown to be more cost effective while increasing volume at certain facilities has been shown to increase quality of care. Review of the literature will establish which procedures are recommended at which levels of care to ensure the most cost-effective use of resources whilst preserving access for patients.

Where resources are scare, concentration of resources (workforce, infrastructure, management) into centers of excellence to allow for robust service delivery at a select number of facilities is more cost effective than having a geographical mismatch between infrastructure, supplies and personnel as occurs at the moment. When difficult decisions need to made for resource allocation, ensuring enough resources for service delivery at a number of facilities is preferable to equitable distribution of resources that cannot be used effectively as they miss on key components.

There is a great deal of overlap between infrastructure and human resources required to make a facility ready for CEmONC, in particular C-section. Once a facility is ready for CEMONC there is little that is needed to make it also useful for delivering basic surgical care. This makes expansion from CEmONC to surgical services cost effective. NSOAP should therefore coordinate with the extensive current efforts to increase availability for CEmONC to avoid duplication of efforts.

Relevant Policies:

- This strategic objective aligns with HSSP IV and MMAM's goals of decreasing maternal mortality, treatment of cervical and other kinds of cancers, and reducing disability adjusted life years.

SO 1.2 Improve the national SOA referral system

Rationale:
Patients face added delays in receiving care due to the dysfunctional referral system. Providers at lower level facilities may also feel compelled to exceed their competencies as there is no clear pathway for the referral of patients from lower to higher competency facilities. Central hospitals cannot be used effectively because they receive high volumes of simple cases from the peripheries as patients self-refer. Improving the referral pathway is, therefore, the key to a functioning surgical system.

More accountability is required around referrals. An electronic tracking system would allow hospitals to refer patients in real time, flag their availability to accept patient referrals to their hospital, log the reasons why a patient is being referred (e.g. stock out, lack of skill etc.) which can help regional health teams better track the impact of stock outs etc. on service interruption and help drive quality improvement.
A functional ambulance system designed to deliver emergency cases (e.g., trauma and emergency cases) is required to ensure timely access to care. Hospital transportation is also required for inter-facility referral to be successfully implemented.

Relevant Policies:

- The National Health and Social Welfare Quality Improvement Strategic Plan recommends the establishment of triage services at all health facilities to promote efficient treatment and appropriate referral of emergency cases requiring care.
- MMAM deemed the referral system 'non-functional' due to ineffective patient transportation, communication, and inefficient resource utilization between public and private sector.

SO 1.3 Strengthen perioperative services at all health facility levels

Rationale:
The National Health and Social Welfare Quality Improvement Strategic Plan states that facilities should have case management protocols for all conditions and these should be vetted by the relevant professional societies. Currently guidelines exist for a minority of surgical and obstetric procedures. These guidelines should be updated and expanded by the professional societies. Standard operating procedures for how patients should be managed from presentation, through the peri-operative and post-operative phase in line with current best practice evidence will help to raise standards around patient care.

WHO safe surgery checklist has been shown to improve surgical quality by decreasing perioperative peri-operative complications including wrong site and wrong patient surgery, and misplaced/unaccounted instruments or gauze[27,28].
The National Health and Social Welfare Quality Improvement Strategic Plan recommends informed consent, both written and verbal, for medical and social services. They have proposed an update of the consent tool and additional training to providers.

Relevant policies:

- The National Health and Social Welfare Quality Improvement Strategic Plan

SO 1.4 Improve critical care services at all hospital levels

Rationale: To provide a high level of emergency and essential surgical care, patients often need escalation to higher levels of care in order to care for them safely through the perioperative phase. Intensive and high dependency units (HDU) allow a higher proportion of nursing and clinical care than ward scenarios to treat the most unwell patients. The upgrading of national intensive and high

[27] Haynes AB, Weiser TG, Berry WR, et al, and the Safe Surgery Saves Lives Study Group. A surgical safety checklist to reduce morbidity and mortality in a global population. *N Engl J Med* 2009; 360: 491–99.
[28] Kwok AC, Funk LM, Baltaga R, et al. Implementation of the World Health Organization surgical safety checklist, including introduction of pulse oximetry, in a resource-limited setting. *Ann Surg* 2013; **257:** 633–39

dependency units will benefit all critically ill patients, beyond surgical patients, highlighting the cross cutting benefits of investment in surgical care.

SO 1.5 Strengthen outreach services from zonal and regional hospitals to lower level facilities and the community

Rationale: There is much surgical capacity concentrated in urban areas. For surgical care of certain conditions particularly chronic conditions such as hernia, hydrocele and cataract, it is often more cost effective to treat these patients near to their home. This spares the patients out of pocket expenditure for travel for themselves and reduces lost income for their attendants. Outreach services also benefit the urban hospital by easing pressure on their operating rooms and outpatient departments and also offer excellent opportunities for resident training. Outreach visits are also an excellent opportunity for CME and supportive supervision of surgical providers at lower levels facilities.

Table 3. Service Delivery: Detailed Outputs, Activities, Indicators and Targets

Service Delivery				
Strategic Objectives	**Outputs**	**Activities**	**Indicators**	**Target (2025)**
SO 1.1 Ensure the equitable distribution of SOA services throughout Tanzania from health center to national levels	**1.1.1** Establish and strengthen the provision of quality essential and emergency surgical, anaesthesia, obstetric and critical care services at national, zonal, district and health center levels	**1.1.1.1** Develop policy guidelines defining essential emergency and elective procedures at each level	Percentage of health facilities providing recommended SOA services for their level of care	100%
		1.1.1.2 Develop and update policy guidelines to define workforce and infrastructure needs to provide services listed in 1.1.1.1		
		Implement recommended workforce and infrastructure guidelines as per 1.1.2 and table x to ensure delivery of :		
		1.1.1.3 Minor surgery at all levels		
		1.1.1.4 Basic general emergency surgery care at health centers and above		
		1.1.1.5 emergency and elective surgical care at district hospitals and above		
		1.1.1.6 Basic emergency orthopaedic surgery at health center and above (open fracture washout and closed fracture reduction)		
		1.1.1.7 Advanced orthopaedic emergency (open fracture repair) and elective orthopaedic surgery at regional level and above		
		1.1.1.8 Basic maxillofacial emergency procedures at the district level (e.g. non displaced facial fractures, primary debridement and cleaning)		
		1.1.1.9 Advanced emergency and elective maxillofacial surgery (e.g. open facial fractures, Lefort 1 advancements) at zonal hospitals and fully functional regional surgical centers		
		1.1.1.10 Basic urological emergencies at the health center level and above (e.g. urinary obstruction and suprapubic catheterization)		
		1.1.1.11 Advanced urological emergencies (ureteric obstruction) and elective urological surgery (e.g prostatectomies) at regional level and above		
		1.1.1.12 Basic neurosurgical emergencies (eg. Burr holes) at district level and above		
		1.1.1.13 Full neurosurgical services at the zonal level and fully functional regional surgical centers		
		1.1.1.14 Plastic and reconstructive surgery at zonal hospitals and fully functional surgical centers		
		1.1.1.15 Zonal hospitals and above to provide interventional radiology services		
		1.1.1.16 Intensive monitoring of the critical and/or post-operative patient at all facilities		
		1.1.1.17 Basic emergency resuscitation and stabilization of the critically unwell patient at all facilities		
		1.1.1.18 ICM level 2 at the district level for ongoing critical care monitoring		
		1.1.1.19 ICM level 3 and level 4 at the regional level and above		

Service Delivery				
Strategic Objectives	**Outputs**	**Activities**	**Indicators**	**Target (2025)**
	1.1.2 Ensure that in each zone there is at least one hospital providing the full package of zonal SOA services	**1.1.2.1** Select regional hospitals to be upgraded to fully functional surgical centers providing the services expected at zonal level	Total number of zones with at least one hospital providing full package of zonal SOA services	All zones
		1.1.2.2 Upgrade the selected 2 regional hospitals to fully functional surigcal centers to provide full spectrum of SOA service delivery expected at a zonal hospital and ensure readiness for ECSA training center requirements		
		1.1.2.3 Upgrade capacity of current zonal hospitals to full expected SOA service delivery		
	1.1.3 Increase access and availability of CEmONC services	**1.1.3.1** Support all activities around CEmONC expansion and work directly with One Plan II	RMNCH representative on NSOAP working group	Appointed by 2018
		1.1.3.2 Ensure inclusion of NSOAP representatives on RMNCH working group and activities to ensure coordination		
SO 1.2 Improve the national SOA referral system	**1.2.1** Develop and implement national surgical referral guidelines	**1.2.1.1** Develop National SOA referral framework which can be adapted and operationalized for each region and harmonizing with existing guidelines	Number of regions with fully developed SOA referral framework	All regions
		1.2.1.2 Each NSOAP regional coordinator and RMOs to form a task force, to lead regional reviews of safe surgical capacity at all facilities		
		1.2.1.3 Each regional taskforce (RMO office-led) adapts national guidelines for regional referral pathway for surgery including which surgeries should be referred where and when		
		1.2.1.4 Ensure SOPs for closed-loop feedback of referrals to and from facilities is included in regional referral framework		
	1.2.2 Ensure a functioning closed-loop referral system	**1.2.2.1** Improve current paper-based surgical referral system	Percentage of referrals-out and in tracked	100%
		1.2.2.2 Explore and pilot electronic closed-loop referral system and ensure compatibility with existing system as per the National eHealth strategy		
		1.2.2.3 Ensure integration of services from public, private and faith based organizations into tracking system to ensure most efficient use of all available providers.		
		1.2.2.4 Develop workforce and infrastructure capacity to maintain and analyze data from referral system		
	1.2.3 Strengthen ambulance and transportation services	**1.2.3.1** Support activities around ambulance transport from One Plan II (1. advocate to local government to procure ambulances 2. Conduct sensitization meetings with business community to support referral system 3. Conduct advocacy meetings with councils through PPP to establish voucher scheme to enhance referral system)	Number of councils with at least one functional ambulance that is in use	All councils
		1.2.3.2 Review and update minimum standards for patient ambulatory care		
		1.2.3.3. Train personnel (driver, paramedic) on use of ambulances and transportation of patients		

Service Delivery				
Strategic Objectives	**Outputs**	**Activities**	**Indicators**	**Target (2025)**
		1.2.3.4 Advocate for funding from CHF and other reimbursement mechanisms for patient transport		
		1.2.3.5 Establish regional emergency contact phone numbers		
SO 1.3 Strengthen perioperative services at all health facility levels	**1.3.1** Develop national guidelines and standardized operating procedures for SOA procedures	**1.3.1.1** Define and map needed guidelines for surgical procedures	SOA guidelines and SOPs in use	Guidelines and SOPs for emergency procedures and anaesthesia
		1.3.1.2 NSOAP working group to work with professional associations to review and update national treatment guidelines in collaboration with the MOHCDGEC		
		1.3.1.3 NSOAP working group, Quality Assurance team, professional associations and frontline workers to collaborate and develop SOPs for SOA procedures at each level		
	1.3.2 Ensure the use of surgical checklists at national, zonal, district and upgraded health center levels	**1.3.2.1** Review available validated checklists around SOA care	Surgical checklist utilization rate	100%
		1.3.2.2 Conduct training and support use of SOA checklists		
SO 1.4 Strengthen outreach services from zonal and regional hospitals to lower level facilities and the community	**1.4.1** Increase frequency and formalize the schedule for community outreach and rural surgical missions	**1.4.1.1** Each region in conjunction with NSOAP representative, professional association and RMO to create schedule for surgical missions to lower levels of care around treatable non-emergency conditions (e.g. hydrocele, hernia, cataract) to eliminate backlog and deliver supportive supervision	Number of districts with a formal surgical and community outreach program	All districts
		1.4.1.2 Develop a curriculum and schedule for community outreach to educate on surgical conditions, surgical care availability and financing options		
SO 1.5 Improve critical care services at all hospital levels	**1.5.1** Develop and implement national guidelines and SOPs for Intensive Care Medicine (ICM) at each health facility level	**1.5.1.1** Review and update service delivery guidelines outlining the level of ICM services for each level of care	SOPs in use for ICM	SOPs in available at all levels
		1.5.1.2 Develop guidelines and implement SOPs for critical care admission and care		
	1.5.2 Provide in-service training for critical care services at all hospital levels	**1.5.2.1** Review existing partnerships and expand exchanges to other hospitals and hospital levels	Hospitals with in-service ICM training framework expanded	All hospitals
		1.5.2.2 Ensure critical care supervision is included in supportive supervision models		

2. Domain 2: Infrastructure and Supplies

SO 2.1 Equip health facilities to provide SOA services appropriate for their level

Rationale:
The current equipment guidelines for operating equipment are outdated. Lack of correct infrastructure is often responsible for adverse patient outcomes, poor staff morale, poor staff retention, reduced service delivery. Professional societies must be empowered as expert consultants to help generate these guidelines that affect their practice.
Relevant policy:

- The Primary Health Services Development Programme – MMAM (2007-2017) prioritized the rehabilitation, construction and upgrading of 5,720 primary health care facilities and 62 district hospitals by year 2017. In addition, they planned to strengthen 2,555 health centers and 62 District Hospitals by construction of Emergency Obstetric Care (EmOC) Theatres complete with medical equipment and furniture and to strengthen communication systems to all 114 Districts by 2017.

SO 2.2 Upgrade ancillary services at each health facility level to support safe SOA care

Rationale:
Ancillary services such as radiology, radiography, sterilization and Intensive Care Management (ICM) critically limit the scale and quality of SOA services provided. Poor access to these ancillary services especially at lower level facilities contributes to the inefficiencies of the referral system. There are not enough MRI, CT scans, ultrasounds and other diagnostic machines required for the high burden of surgical diseases in the country. Sterilization challenges remain due to lack of proper sterilization equipment and maintenance. There are currently very few properly functioning ICM facilities, especially in rural areas. All these deficiencies in ancillary services severely limit SOA care provision and must be addressed in order to meet the high SOA need in the country.

SO 2.3 Strengthen Utilities (oxygen, water, electricity) at all health facilities providing SOA services

Rationale:
Basic infrastructure such as oxygen, water, electricity and internet access are fundamental in surgery as well as many other medical conditions. With a single provider based in Dar es Salaam (Tanzania Oxygen Limited) access is currently poor with facilities paying high costs and time resources procuring oxygen. The supply chain is not resilient resulting in poor access to oxygen at many facilities. The high cost is being lost to the private sector. Sustainable oxygen PPPs can generate income for the zone/region to be reinvested in strengthening the healthcare system.

Sterility is the basis of safe surgical care. The operating theatre complex must be prioritised within a facility for access to safe water. A separate backup water supply will isolate the operating theatre complex from competing priorities during water shortages.

Electricity is vital to surgery as surgical care cannot be provided without light, suction, and a functional anaesthesia machine. Sudden loss of electricity intraoperatively can result in adverse events for patients and even death.
Internet is vital for safe referrals, robust data collection and CPD. A functioning internet connection can improve staff retention in rural areas by preventing isolation.
Relevant policy:

- As a broad statement, MMAM aims to provide, medical equipment, furniture and plants in 6,201 health facilities.

SO 2.4. Ensure robust supply chain of necessary consumables for safe SOA care

Rationale:
Lack of consumables disrupts service delivery because it results in suspension of surgical activities. This creates large amounts of system inefficiency as staff and equipment cannot be deployed. Unreliable service delivery disrupts the referral system and results in delayed care for patients. Lack of consumables leads to low morale as providers feel they cannot provide high quality of care to their patients
Weak purchasing contracts mean that equipment-lifespan is often reduced through a lack of availability of parts, lack of preventative maintenance, lack of training around maintenance and appropriate use. This results in service disruption when the equipment needed is not available. Strong guidelines exist around appropriate purchasing but these are not currently enforced

Many donations of medical equipment and supplies are currently inefficiently deployed as they are often inappropriate for the facilities they are sent to or because the spare parts, reagents and maintenance require are not available. Robust guidelines for donations have been developed but they are not broadly implemented.
The NSOAP would incorporate the existing systems for supply management in its execution.
Relevant policies:

- The National Health and Social Welfare Quality Improvement Strategic Plan aims to address weakness in supply chain management.
- As per the Pharmaceutical Sector Action Plan (PSAP), greater numbers of qualified pharmaceutical professionals will be added to the workforce and actively employed in the public and private sectors to provide patient care and supply chain services at all levels.

SO 2.5 Ensure all medicines and medical supplies donations are implemented in sustainably

Rationale:
Although guidelines on donation of medicines and medical supplies exist, they are currently poorly implemented. Medical equipment is often donated without appropriate training on their use or proper maintenance plan. This strategic objective seeks to strengthen current efforts in the implementation of these guidelines and device new strategies for health facilities to better manage medical and medicines donations.

SO 2.6 Increase accessibility and utilization of safe blood and blood products in all facilities providing SOA services

Rationale:
The first Tanzania National Blood Transfusion Policy (2005), aimed to establish a sustainable nationally coordinated blood transfusion service, backed with necessary policies and standards. This in turn involved the creation a sustainable mechanism that would ensure availability of adequate financial resources for operational activities and to recruit adequate personnel. It also sought to introduce an effective mechanism for maintaining quality, efficiency and effectiveness of the National Blood Transfusion Service (NBTS) activities. The NSOAP would align with those stated goals

Relevant Policies:

- Tanzanian National Blood Transfusion Policy

SO 2.7 Establish capacity for equipment maintenance and repair (see related Workforce recommendations)

Rationale:
Lack of maintenance of surgical equipment often leads to cancellation of surgeries or delays in providing surgeries in many hospitals around the country. It is therefore important to address this challenge to attain the goal of providing access to timely, affordable and safe surgical, obstetric and anaesthesia services for Tanzanian citizens.

Relevant policies:

- National Health and Social Welfare Quality Improvement Strategic Plan

Table 4. Infrastructure: Detailed Outputs, Activities, Indicators and Targets

Infrastructure				
Strategic Objectives	**Outputs**	**Activities**	**Indicator**	**Target (2025)**
SO 2.1 Equip health facilities to provide SOA services appropriate for their level	**2.1.1** Develop and implement minimum infrastructure and equipment standards guidelines	**2.1.1.1** MOHCDGEC in collaboration with TSA, SATA, AGOTA as well as BMET experts to review minimum SOA infrastructure, equipment, consumables and support services to align with service delivery and workload at each facility	Number of districts with equipment plan	All district
		2.1.1.2 Audit available infrastructure and equipment to identify gaps		
		2.1.1.3 Each district to generate and implement an equipment plan to procure the infrastructure required for safe service delivery		
		2.1.1.4 Plans should include reallocation of unused equipment for most efficient use		
	2.1.2 Equip upgraded health centers, district, regional, national level hospitals to provide all SOA procedures as recommended by NSOAP committee	**2.1.2.1** Councils and facilities develop a budget for procurement of SOA infrastructure equipment and supplies as defined in 2.1.1	Percentage of surgical health facilities with the minimum infrastructure recommendations for their level of care	100%
		2.1.2.2 Procure required equipment to meet 2.1.1.1		
		2.1.2.3 Procure environment appropriate anaesthesia machines		
	2.1.3 Equip upgraded health centers already providing CEmONC to provide surgical services appropriate to their level of care	**2.1.3.1** Define items necessary to upgrade from CEmONC to basic surgical services at upgraded health facilities in collaboration with end users	Percentage of CEmONC health centers with infrastructure to provide basic surgical services as per service delivery guidelines	100%
		2.1.3.2 Procure standard equipment needed for upgrade to surgical care expected for health center level		
	2.1.4 Operationalize IPC guidelines at facilities providing SOA services	**2.1.4.1** Define standards for health waste management as per WASH guidelines	Percentage of health facilities providing SOA services with waste management system that meets WASH guidelines	100%
		2.1.4.2 Create facility based waste management committee as per WASH guideline		
		2.1.4.3 Ensure all health facilities have recommended health waste management infrastructure on site in all new constructions		
	2.1.5 Ensure all facilities providing SOA services have access to laundry services	**2.1.5.1** Define laundry management standards and equipment at each health facility level	Percentage of SOA facilities with reliable laundry services	100%
		2.1.5.2 Upgrade all health facilities with recommended laundry management infrastructure		
		2.1.5.3 Disseminate guidelines on recommended laundry management protocols at each health facility level		
	2.1.6 Enforce guidelines around equipment purchasing regarding maintenance contracts and service training	**2.1.6.1** Ensure all procurement occurs with Planned Preventative Maintenance (PPM) contracts	Percentage of equipment purchases with PPM contracts	100%
		2.1.6.2 Orientate procurement team around current equipment purchasing guidelines and model contracts		
		2.1.6.3 Engage private industry suppliers to provide training on maintenance packages/contracts available		
SO 2.2 Upgrade ancillary services at each health facility level to support safe SOA care	**2.2.1** Upgrade and equip radiology and radiography equipment at each level of care to support safe SOA services	**2.2.1.1** Audit current radiography equipment and identify gaps	Percentage of SOA facilities equipped with radiology and	100%
		2.2.1.2 Equip all upgraded health centers, and above to provide ultrasound and x-ray imaging services		

Infrastructure				
Strategic Objectives	**Outputs**	**Activities**	**Indicator**	**Target (2025)**
		2.2.1.3 Equip all regional hospitals and zonal hospitals with CT scanners	radiography equipment	
		2.2.1.4 Equip all zonal hospitals to provide MRI imaging services		
	2.2.2 Upgrade and equip laboratory services appropriate for each facility level to support SOA services	**2.2.2.1** Define and procure necessary laboratory equipment relevant to perform the procedures for each level of care	Percentage of SOA facilities equipped with appropriate laboratory services	100%
		2.2.2.2 Upgrade all zonal hospitals and fully functional surgical centers to have access to histopathology services		
		2.2.2.3 Ensure all lower-level services have a clear referral pathway for escalating specimens and receiving reports		
	2.2.3 Upgrade and equip sterilization services appropriate for each facility level to support SOA services	**2.2.3.1** Define and procure necessary sterilization equipment for the health center level and above	Percentage of SOA facilities equipped with a functional autoclave	100%
		2.2.3.2 Provide in-service sterilization training to hospital staff		
	2.2.4 Upgrade and equip Intensive care medicine (ICM) services at health facilities per national guidelines	**2.2.4.1** Construct, upgrade and equip ICM units at district, zonal and national levels	Percentage of SOA facilities with at least one fully equipped and functional ICM	100%
SO 2.3 Strengthen Utilities (oxygen, water, electricity at all health facilities providing SOA services	**2.3.1** Ensure consistent availability of medical oxygen to all health facilities providing SOA services	**2.3.1.1** Construct sustainable high volume oxygen plants for each zonal level hospital to supply oxygen to their catchment hospitals	Percentage SOA facilities with consistent supply of medical oxygen	100%
		2.3.1.2 Ensure availability of functional oxygen concentrators at all facility levels		
		2.3.1.3 Ensure availability of oxygen equipment such as cylinders, gauge, flowmeters, piping, facemasks, pulse oximetry at all health facility levels		
	2.3.2 Ensure facilities providing SOA services have reliable access to safe running water	**2.3.2.1** Support existing guidelines to *"Basic Standards for Health Social Welfare Facilities*"	Percentage of SOA facilities with reliable access to clean water	100%
		2.3.2.2 Provide access to safe piped water for all health facilities providing SOA services		
		2.3.2.3 Provide clean water backup (sufficient for 2 days) for operating theatres separate from the rest of the facility		
	2.3.3 Ensure all health facilities providing SOA services have reliable and consistent access to electricity	**2.3.3.1** Ensure all facilities providing surgical and critical care services have 24/7 reliable electricity supply	Percentage of SOA facilities with reliable and consistent access to electricity	100%
		2.3.3.2 Ensure all operating suites have at least one alternative electricity backup source (automatic generators, solar power)		
		2.3.3.3 Ensure recommended generators are automatic as part of basic equipment for all new operating rooms		
SO 2.4 Ensure robust supply chain of necessary consumables for safe SOA care	**2.4.1** Ensure constant availability of necessary consumables at all health facilities providing SOA services	**2.4.1.1** Working group including members of professional associations as well as BMET experts to review essential drug list and a minimum consumable list to include drugs for SOA care	Stock-out rate of tracer minimum surgical consumables at SOA facilities	0%
		2.4.1.2 Track availability of minimum consumables at each facility providing SOA services		
		2.4.1.3 Each facility develops an escalation plan to report and solve stock-out challenges		
		2.4.1.4 Track reduced service delivery resulting from lack of access to consumables using electronic referral app		

Infrastructure				
Strategic Objectives	**Outputs**	**Activities**	**Indicator**	**Target (2025)**
		2.4.1.5 Train OR nurse managers on surgical consumables Forecasting and Quantification		
SO 2.5 Ensure all medicines and medical supplies donations are implemented in a sustainably	**2.5.1** Implement guidelines for medicines and medical supplies donations	**2.5.1.1** Review current donation and disposal guideline to include surgical and medical equipment	Proportion of SOA facilities trained in donations guidelines	100%
		2.5.1.2 Provide training at facility level in public, faith based and private hospitals with appropriate staff to sensitize to current guidelines and implement the donation checklist		
		2.5.1.3 Encourage reallocation of equipment between facilities approved by the RMO to ensure most efficient deployment of available resources		
		2.5.1.4 Ensure all purchased or donated equipment has appropriate training on maintenance and repair for facility and regional biomedical technicians		
SO 2.6 Increase accessibility and utilization of safe blood and blood products in all facilities providing SOA services	**2.6.1** Ensure adequate availability of safe blood to all facilities doing SOA procedures	**2.6.1.1** Increase the number of units of blood collected	Number of whole blood units per 1,000 population	10 Units /100,000
		2.6.1.2 Advocate and budget for voluntary blood donation, collection and transportation at the district level, in collaboration with NBTS		
		2.6.1.3 Councils to mobilize funds for screening and testing of donated blood		
		2.6.1.4 Facilities to budget for proper storage of blood and blood products		
	2.6.2 Implement the NBTS clinical guidelines for appropriate use of blood and blood products	**2.6.2.1** Train all SOA providers on the NBTS clinical guidelines on appropriate use of blood and blood products	Number of practicing SOA providers trained on NBTS clinical guidelines	100%
		2.6.2.2 Establish a data system for monitoring the utilization, unmet need and wastage of blood		
SO 2.7 Establish capacity for equipment maintenance and repair (see related Workforce recommendations)	**2.7.1** Each facility to have a BMET and preventive maintenance plan	**2.7.1.1** Ensure each facility providing SOA care has a preventative maintenance plan, that is budgeted	Number of regions with regional BMET plan	100%
		2.7.1.2 Strengthen managerial capacity with regard to preventative maintenance		
		2.7.1.3 Explore the possibility of contractual agreements with equipment providers, which include maintenance, and assess its cost-effectiveness		

3. Domain 3: Human Resources

SO 3.1 Increase physician SOA density

Rationale
In 2015, the Lancet Commission on Global Surgery estimated that at least 20-40 surgical specialists are needed per 100,000 population to improve surgical patient mortality and morbidity outcomes. Tanzania's density of specialist surgical workforce is a total of 0.46 physician surgeons, obstetricians and anaesthesiologists (SOA) per 100,000 population. Thus, there are insufficient providers, in particular specialist providers, to achieve the recommended staffing levels at all levels of care.
Relevant policy

- Human Resource for Health and Social Welfare Strategic Plan, 2014-2019
- Staffing Levels for Ministry of Health and Social Welfare Departments, Health Service Facilities, Health Training Institutions and Agencies, 2014-2019

SO 3.2 Increase employment opportunities for graduating SOA specialists

Rationale
Currently, Tanzania has 11 medical schools, admitting an average of 1,580 students per year. However, anecdotal evidence suggests that approximately a half of the medical graduates are unemployed. A 2012 census found that 39.6% of tracked medical graduates were not practicing clinical medicine. In the context of such a shortage of clinical providers, this creates low staff morale and inhibits the improvement of all health outcomes.

SO 3.3 Ensure equitable distribution of SOA workforce throughout the country

Rationale
Although the rural population accounts for over 70% of the population in Tanzania, many hospitals across the country have no permanent surgical or medical specialist, anaesthesiologist, and/or healthcare workers with formal specialty training in emergency or critical care. Forty-one percent of practicing medical officers are located in the cities of Arusha, Dar es Salaam, Mbeya and Moshi.
Providing one cadre of SOA without another leads to unsafe care. Deployment of a single SOA provider means a functional and efficient service is difficult because it generates unsustainable expectations of that staff member to be available 24/7. This unreliability of service provision at a given facility creates a non-functional referral system. Isolation of solo specialists causes low morale and poor staff retention. A lack of administrative support when deploying specialists means their time is inefficiently used in management duties rather than clinical duties.
Offering continuing education after a certain period of service is one of the most powerful recruitment instruments available. Moreover, a rural component in training programs can help increase the recruitment of rural practitioners. Increased salaries and hardship allowances will also be a strong driver.
Relevant policy

- Staffing Levels for Ministry of Health and Social Welfare Departments, Health Service Facilities, Health Training Institutions and Agencies, 2014-2019

SO 3.4 Upskill current SOA providers through CME

Rationale: Training of new workforce has a long time-lag. Upskilling the current workforce to provide a greater volume and higher quality service is an efficient way to expand surgical care. CME has also been shown to be an important factor in rural retention and staff morale.

SO 3.5 Define the role of allied health professionals and task-sharers in SOA service delivery

Rationale
Safe surgical care takes many more cadres than just specialist clinicians. For expansion in volume and quality of surgical services to occur, allied health professional roles must be defined and supported.
Relevant policy

- New guidelines on task shifting were introduced in Tanzania in January 2016. These state that, at the district level, surgeries may be performed by MOs, AMOs, nurses and assistant nursing officers and nursing officers.
- Human resources for health and social welfare strategic plan 2014-2019
    - Section 5.6.2.1 calls for improved regulation of task sharers/shifters through Tanganyika council

SO 3.6 Establish and implement national CPD/CME guidelines

Rationale
The presence of a national guideline on education and professional development allows for maintaining appropriate standards and building capacity.
Relevant policy

- CPD is a key priority in Human resources for health and social welfare strategic plan 2014-2019

SO 3.7 Strengthen management and leadership capacity around SOA Care

Rationale
Formalisation and capacity building of leadership and management roles are cross-cutting priorities across the health sector and they are included in most national level health policies and plans. Strong management can help to overcome material constraints and make most effective use of resources.
Relevant policy

- Human resources for health and social welfare strategic plan 2014-2019

Table 5. Human Resources: Detailed Outputs, Activities, Indicators and Targets

Human Resources				
Strategic Objectives	**Outputs**	**Activities**	**Indicator**	**Target (2025)**
SO 3.1 Increase the SOA provider density	**3.1.1** Decrease financial barriers to entry for SOA workforce, especially those who will work in rural areas	**3.1.1.1** Ensure sponsorship for at least one anaesthesiologist from each region (n=26) per year	Number of regions with at least one anaesthesiologist	All regions (26)
		3.1.1.2 Train and graduate 200 specialist general surgeons by 2025	Specialist surgical workforce (SOA) per 100,000 population (WDI)	2.5
		3.1.1.3 Train and graduate 200 orthopaedic surgical specialists		
		3.1.1.4 Train and graduate 200 obstetric specialists by 2025		
		3.1.1.5 Train and graduate a total of 240 anesthesiologists by 2025		
		3.1.1.6 Train and graduate 80 urologists by 2025		
		3.1.1.7 Train and graduate 15 plastic surgeons by 2025		
		3.1.1.8 Train and graduate 15 ENT surgeons by 2025		
		3.1.1.9 Train and graduate 15 pediatric surgeons by 2025		
		3.1.1.10 Train and graduate 42 neurosurgeons by 2025		
		3.1.1.11 Train and graduate 550 NTA level 7 nurse anaesthetists by 2025		
		3.1.1.12 Train and graduate 550 NTA level 8 nurse anaesthetists by 2025		
		3.1.1.13 Train and graduate 550 NTA level 7 OR/critical care nurses by 2025		
		3.1.1.14 Train and graduate 550 NTA level 8 OR/critical care nurses by 2025		
	3.1.2 Increase the intake of SOA residents through the expansion of existing programs and creation of new decentralized training programs	**3.1.2.1** Facilitate discussions with TCU for recognition of ECSA training model	Number of ECSA training centers per zone	One per zone
		3.1.2.2 Ensure every zone has a designated satellite training center (at fully functional surgical center/zonal hospital) through the adoption of the ECSA "Collage" training model to support surgical graduates to practice where they train		
		3.1.2.3 Upgrade training centers (zonal hospitals and fully functional regional surgical centers) to have a requisite number of trainers, workload and quality guidelines		
	3.1.3 Establish a practical training program as part of the compulsory 1 year internship after medical school	**3.1.3.1** Incorporate practical training in surgery, anesthesia and obstetrics during internship		100%
		3.1.3.2 Allow the option of choosing a designated specialty during internship and provide training		

Human Resources				
Strategic Objectives	**Outputs**	**Activities**	**Indicator**	**Target (2025)**
		3.1.3.3 Structure centers that concentrate more on SOA training for interns, to attract those going to work in remote areas to build up SOA skill and attract those wanting to go into SOA specialty training	Percentage of graduating MOs who have completed a rotation in surgery or anaesthesia	
	3.1.4 Ensure basic surgical and anaesthesia core competencies are taught and assessed in the undergraduate medical curriculum	**3.1.4.1** Develop a robust curriculum for surgical and anaesthesia competency	Percentage of Medical schools with surgical and anaesthesia skills assessment as core competency	100%
		3.1.4.2 Ensure adoption surgical and anaesthesia competency into undergraduate curriculum at all medical schools in all areas		
	3.1.5 Implement National graduate competency exams	**3.1.5.1** Ensure all graduating trainees are deemed competent using the same standards	% of trainees undergoing standardized exams	100%
SO 3.2 Increase employment opportunities for graduating SOA specialists	**3.2.1** Staffing permits to be made available to meet minimum staffing guidelines	**3.2.1.1** Review staffing levels for inclusion of surgery and anaesthesia specialists on minimum staffing guidelines from MOHCDGEC down from national to district level	% of health facilities meeting minimum SOA staffing guidelines	100%
		3.2.1.2 Ensure 100% of upgraded health centers meet minimum staffing recommendations for SOA service delivery		
		3.2.1.3 Ensure 100% of district hospitals meet minimum staffing recommendations for SOA service delivery		
		3.2.1.4 Ensure 100% of regional hospitals meet minimum staffing recommendations for SOA service delivery		
		3.2.1.5 Ensure 100% of zonal hospitals meet minimum staffing recommendations for SOA service delivery		
		3.2.1.6 Regional and district levels to have retention schemes for SOA specialists		
SO 3.3 Ensure equitable distribution of SOA workforce throughout the country	**3.3.1** Ensure deployment of HR as functioning HR clusters-surgeon/anaesthesiologist/obstetrician/Administrative support	**3.3.1.1** Ensure minimum staffing guidelines are met from higher level to lower levels of care for specialty care and lower to higher for emergency care	% of health facilities meeting minimum SOA staffing guidelines	Zonal hospitals complete by 2020 Regional hospitals complete by 2023 District and health centers complete by 2025
		3.3.1.2 Ensure minimum staffing guidelines allow for a pool of specialists at regional level to allow coverage for leave/training at the district hospital to allow uninterrupted service delivery		
		3.3.1.3 Ensure the minimum staffing levels are deployed as a functioning surgical team for sustainable coverage		
	3.3.2 Incentivize retention of rural SOA workforce	**3.3.2.1** Improve matching of staff with incentives and preferences to increase the likelihood of assigned posts being taken up	% of SOA workforce working in rural councils	50%
		3.3.2.2 Sponsor and train providers from remote areas to maximize chance of returning to rural areas		
		3.3.2.3 Develop and establish new contracting systems such as bonding systems for those receiving funding		
		3.3.2.4 Provide non-financial incentives including housing, electricity and internet access		

Human Resources				
Strategic Objectives	**Outputs**	**Activities**	**Indicator**	**Target (2025)**
SO 3.4 Upskill current SOA providers through CME	**3.4.1** Provide in service training programs, to refresh and enhance skills of current providers at the hospital level and above	**3.4.1.1** Ensure all hospital level providers receive appropriate in service training adapted to the needs of each hospital. (E.g. ATLS, Neonatal resuscitation, safe surgery checklist etc.)	% of practicing SOA providers attending at least one CPD/CME training per year	100%
		3.4.1.2 Each hospital to have an in-house training plan with an allocated budget		
	3.4.2 Provide additional short courses to refresh and enhance skills of current providers at the health center and community level	**3.4.2.1** Design curriculum and deliver training to all health center workers and community health workers on: Recognition of surgical conditions, recognition of treatable congenital malformations, treatment of minor burns, the surgical referral pathway--> who to refer, to which hospital, when (see service delivery)	% of health center workers and CHWs trained on surgical condition recognition	100%
	3.4.3 Develop a program for supportive supervision for SOA and nursing staff	**3.4.3.1** Develop and coordinate programs at the zonal level for supportive supervision and mentorship for surgery, anaesthesia and obstetric providers and nurses at regional hospitals	Zones with a supportive supervision framework which includes all regional, district and health centers	Complete by 2019
		3.4.3.2 Develop and coordinate programs at the regional level for supportive supervision and mentorship for general surgery, anaesthesia and obstetric providers and nurses at health centers and district hospitals		
SO 3.5 Define the role of allied health professionals and task-sharers in SOA service delivery	**3.5.1** Establish an appropriate task-sharing system	**3.5.1.1** Identify existing task sharing practices	Long term work plan for AMOs devised	Complete by 2019
		3.5.1.2 Develop guidelines for each SOA task-sharing cadre including supervision, reporting and communication pathways		
		3.5.1.3 Monitor and evaluate task sharing programs, and report routine outcome measures		
		3.5.1.4 Convene working group with MOHCDGEC, professional societies to define the scope of work for AMOs, competency curriculum, distribution, utilization and long term planning around AMO employment and regulation		
	3.5.2 Increase capacity of biomedical equipment technicians	**3.5.2.1** Ensure training programs for BMET at each zonal hospital	Number of BMETs per 100,000 population	
		3.5.2.2 Establish sufficient positions for BMET at each zonal hospital		
	3.5.3 Increase capacity of nurse anaesthetists	**3.5.3.1** Standardize NTA level 7 & 8 nurse anaesthesia training curriculum	Number of level 7 & 8 nurse anaesthetists per 100,000 population	1000 trained **Calculated from minimum staffing guidelines*
		3.5.3.2 Expand nurse anaesthetists training centers to include all zonal centers		
		3.5.3.3 Transition all practicing nurse anaesthetists to one year trained NTA then to 3 year NTA staff the health centers		
		3.5.3.4 Implement a nurse anaesthesia logbook to allow supportive supervision of nurse anaesthetists and review of practice		
		3.5.3.5 Develop supportive supervision networks of nurse anaesthetists to link them to anaesthesia providers at the regional level		
SO 3.6 Establish and implement national CPD/CME guidelines	**3.6.1** Establish a system to link CPD/CME to medical licensing for SOA specialist practitioners	**3.6.1.1** Professional associations (for example: TSA, SATA, AGOTA, TOA) to work with Medical Council of Tanganyika to develop guidelines for revalidation in line with the Medical and Dental and Allied Professionals Act of 2017.	Revalidation guidelines completed	Complete by 2019
	3.6.2 Increase opportunities for CPD/CME for SOA practitioners	**3.6.2.1** Acquire access to online tool to log CME activities	% of practicing SOA	100%

Human Resources				
Strategic Objectives	**Outputs**	**Activities**	**Indicator**	**Target (2025)**
		3.6.2.2 Seek external partners for short course training	providers attending at least one CPD/CME training per year	
		3.6.2.3 Accredit CME for trainers and learners during internal mission activities		
SO 3.7 Strengthen management and leadership capacity around SOA care	**3.7.1** NTA level 7 & 8 theatre nurse trained	**3.7.1.1** Develop curriculum for NTA level 7 & 8 theatre nurse training	Number of NTA level 7 & 8 theatre nurses per 100,000 population	1000 *calculated from minimum staffing guidelines
		3.7.1.2 Implement theatre nurse training at 4 training institutions		
		3.7.1.3 Train 40 theatre nurses per year at each of the 4 training institutions		
	3.7.2 Improved communication and team work	**3.7.2.1** Provide training on leadership and problem solving to all clinical and non-clinical staff involved in SOA care through a train the trainer model	Percentage of surgical teams trained on leadership and communication	100%
		3.7.2.2 Develop standards for team communication and team leadership and run necessary training		
		3.7.2.3 Share best practices and exchange around management capacity building		

4. Domain 4: Information Management and Technology

SO 4.1 Ensure collection and reporting of SOA indicators

Rationale
Data collection, analysis and reporting plays a crucial role in efficient surgical systems. Surgical data at the national and facility level can be used to inform decisions and policies around surgical care. The Ministry's *Quality Improvement Strategic Plan 2013-2018,* outlines the ministry's commitment to improving health outcomes for patients through tracking key quality improvement indicators. However, only one of those key indicators directly relates to surgery, namely *percentage of patients who were informed on procedures, possible risk and alternative treatment option prior to surgical procedure*. While this indicator is useful, the lack of other quality-improvement indicators highlights the need to develop additional key indicators for quality improvement purposes in safe surgical care provision.
Relevant policy

- Quality Improvement Strategic Plan 2013-2018

SO 4.2 Ensure systematic transparent reporting and utilization of SOA indicators

Rationale
The regular collection and dissemination of data and indicators of surgical quality plays an important role in monitoring and evaluating surgical programs, and in the process of improving outcomes.
Relevant policy

- Guideline for Data utilization of Human Resource for Health Information System (HRHIS) and Training Institution Information System (TIIS), Ministry of Health and Social Welfare, October 2011

SO 4.3 Implement electronic medical records for capturing SOA data

Rationale
Surgical data collection, storage and analysis remains a challenge at the facility level as most hospital records are paper-based and analysis of collected data is limited. Semi-structured interviews with clinicians and administrators at National, Zonal and district public hospitals conducted by the SS2020 team, revealed that a majority of data collection remains paper-based. Few facilities had electronic records in use.
Relevant policy

- Tanzania National eHealth Strategy 2012-2018, Ministry of Health and Social Welfare, May 2013
- Guidelines and Standards for Integrated Health Facility Electronic Management Systems (iHFeMS)

SO 4.4 Build research capacity around SOA surgical systems

Rationale
Research is an integral component of education, quality improvement and capacity building. At present, few facilities in Tanzania conduct autonomous research around the SOA system.

SO 4.5 Enhance telemedicine services at health facilities

Rationale
The main rationale for the development of telemedicine services is the desire to provide health workers in remote settings the ability to interact with specialists working at more developed sites. Currently, 55% of all healthcare workers are working in rural areas, and many hospitals across the country have no permanent surgical or medical specialist, anaesthesiologist, and/or healthcare workers with formal specialty training in emergency or critical care.
Relevant policy
Tanzania National eHealth Strategy 2012-2018, Ministry of Health and Social Welfare, May

Table 6. Information Management and Technology: Detailed Outputs, Activities, Indicators and Targets

Information management and Technology				
Strategic Objectives	**Outputs**	**Activities**	**Indicators**	**Target (2025)**
SO 4.1 Ensure collection and reporting of SAO indicators	**4.1.1** Develop and implement the monitoring and evaluation framework for collecting indicators around SAO care capacity and quality	**4.1.1.1** Convene a group to define monitoring and evaluation framework including -Indicators -Indicator definitions -SOPs for indicator collection and reporting -Targets -Relevant data leverage SOPs	Monitoring and evaluation framework developed	Complete by 2018
		4.1.1.2 Implement the monitoring and evaluation framework at all facilities	% of facilities reporting on SOA indicators	100%
	4.1.2 Include the 6 recommended Lancet Surgical Indicators in Monitoring and Evaluation framework	**4.1.2.1** Include provisions for collection and national reporting of the 6 Lancet indicators within the monitoring and evaluation framework. Indicator 1: proportion of population with 2 hour access to Bellwether procedures -Track which facilities are providing consistent Bellwether surgical services at adequate volume -Use existing tools to calculate the proportion of the population that resides within a 2-hour travel time from these facilities Indicator 2: Perioperative Mortality -Define the data requirements, update and standardize theatre logbooks to allow risk stratification information (Age, ASA class, Wound classification, Functional status, Urgency) into surgical logbook to allow calculation of risk adjusted POMR and complications Indicator 3: SAO density -Collect appropriate IHRIS data to ensure that all SOA specialists, as well as other clinicians (e.g. nurse anesthetists, AMOS, etc.), and their level of qualification are captured -Collect grade of personnel performing surgery in logbooks so as to better understand the contribution of each cadre to service provision Indicator 4: Procedure density -Integrate tracking of surgical volume and case mix into HMIS to collect national surgical volume data Indicator 5 and 6: catastrophic and impoverishing expenditure. -Select certain procedures from each specialty (gen. surgery, orthopedics, obstetrics) and assess the patient out of pocket costs for surgery.	6 Lancet indicators included in M+E framework	Complete by 2018
	4.1.3 Ensure consumable availability is included in the monitoring and evaluation	**4.1.3.1** Select essential anaesthesia and resuscitation drugs to integrate into the tracer medication on HMIS	Anaesthesia Tracer drugs reported on national	Available from 2018 onwards

Information management and Technology				
Strategic Objectives	**Outputs**	**Activities**	**Indicators**	**Target (2025)**
	framework		dashboard	
		4.1.3.2 Select essential surgical consumables to integrate into tracer consumables	Surgical Consumables reported on national dashboard	
	4.1.4 Create new SOA specific registries	**4.1.4.1** Set up national trauma registry to track morbidity and mortality	National Trauma Registry established	Roll out complete by 2020
		4.1.4.2 Set up SOA related morbidity and mortality registry (POMR)	National SOA mortality and morbidity registry set up	
SO 4.2 Ensure systematic transparent reporting and utilization of SAO indicators	**4.2.1** Develop and implement data use and dissemination strategy	**4.2.1.1** Develop reporting SOPs for ensuring that necessary data is collated and escalated to district, regional and national levels	Complete feedback loop established in M+E framework	Annual up to date information on surgical indicators available from 2019 onwards.
		4.2.1.2 Develop SOPs to ensure relevant data and reports are fed back to all levels down to facility level.		
		4.2.1.3 Ensure that internationally recommended indicators are published and reported on the appropriate international platforms (WHO, WDI)	WHO/WDI core surgical indicators available on WDI website	
		4.2.1.4 Consider what information needs to be fed back to the community to promote community engagement and advocacy and how it will be shared	Community included in national M+E framework	
	4.2.2 Mortality and morbidity meetings instituted to review and action relevant data	**4.2.2.1** Develop, disseminate and implement guidelines for mortality and morbidity review and response meetings	Percentage of facilities with documented monthly morbidity and mortality meetings	100%
		4.2.2.2 Develop critical incident SOPs to define critical incidents and ensure they are reported and logged at the time of the event		
		4.2.2.3 Each facility at all levels to institute SOA-related mortality and morbidity meetings on a monthly basis. Each M&M meeting should be adequately documented and conclude with an action plan to improve quality of service		
		4.2.2.4 Expand the quarterly regional maternal M&M meeting to cover all SAO cases		
SO 4.3 Implement electronic medical records for capturing SOA data	**4.3.1** Ensure health facilities SOA data can be aggregated and reported digitally	**4.3.1.1** Ensure all levels of facility from health center and above have functioning computers and internet connectivity in the OR to log case information	Anaesthesia and Surgical indicators present on national dashboard	All indicators present on dashboard from 2019
		4.3.1.2 Support the activities of the E-health strategy in strengthening digital information management		
		4.3.1.3 Ensure anaesthesia data is captured in the EMR		
		4.3.1.4 Integrate surgical indicators into existing data collection platforms (e.g HMIS)		
		4.3.1.5 Advocate for inclusion of SOA indicators on the national dashboard		
SO 4.4 Build research capacity around SOA systems	**4.4.1** Increase the number and quality of research projects designed and implemented	**4.4.1.1** Build capacity of SOA providers in research and clinical audit methods	SAO priorities on NIMR list being investigated	

Information management and Technology				
Strategic Objectives	**Outputs**	**Activities**	**Indicators**	**Target (2025)**
	by residents and SOA providers	**4.4.1.2** Inform the SOA research priorities with NIMR		
		4.4.1.3 Promote independent research and clinical audit in SOA		
SO 4.5 Enhance telemedicine services at health facilities	**4.5.1** Implement a telemedicine strategy for SOA	**4.5.1.1** Review and strengthen the existing telemedicine capacities to make sure there are being used optimally	Proportion of zones with a formalised schedule in existence for coverage of telephone consultation services	100%
		4.5.1.2 Sensitize SOA providers as to the existing available telemedicine services		
		4.5.1.3 Generate a schedule and guidance for SOA telemedicine coverage for: -Consultation for difficult cases - Referral decisions - Review and audit of cases - Higher to lower level mentorship		
		4.5.1.4 Work with E-health strategy team and e-health centers to ensure SOA is considered for adoption of telemedicine		

5. Domain 5: Finance

SO 5.1 Ensure adequate funding to support NSOAP activities

Rationale
Although highly cost effective in the long term, NSOAP implementation will require a dedicated budget in the near term. There are many competing priorities for government funding but direct allocation of funds to NSOAP activities will ensure resources can be directed where required.
Relevant policies

- HSSP IV aims to increase the share of total government expenditure allocated to health from 9.1% in 2015 to 10.0% by 2020.

SO 5.2 Decrease catastrophic and impoverishing expenditure resulting from surgery

Rationale
It is estimated that, in Tanzania, 85% of the population is at risk of impoverishing expenditure from seeking surgical care and 64% is at risk of catastrophic expenditure. WHA resolution 68.5 advocates the inclusion of essential emergency surgical care within Universal health coverage, a key recommendation of HSSP IV. There are reported to be large variations in the cost of surgical services between facilities and between regions. A price index would empower patients to better understand the value of their care. Patients are often underprepared for the full cost of their surgical care and, as a result, they face financial hardship. Bundled payment and improved price transparency can allow better patient financial planning.
Relevant policies

- HSSP IV sets the target of increasing enrolment in social health insurance schemes from 19% in 2015 to 50% by 2020.

Table 7. Finance: Detailed Outputs, Activities, Indicator and Targets

Finance				
Strategic Objectives	**Outputs**	**Activities**	**Indicator**	**Target (2025)**
SO 5.1 Ensure adequate funding to support SOA activities	**5.1.1** Assess the current funding that SOA receives	**5.1.1.1** Undertake a thorough mapping of current SOA resources including national, regional and local government and partners.	Resource mapping completed	Completed by 2018
	5.1.2 Advocate for SAO needs throughout Tanzania at the national level	**5.1.2.1** Engage Parliamentarian Champions e.g.(Safe motherhood group, Benjamin Mkapa foundation, social services committee)	Domestic funds committed at a national level to SOA	30% of annual NSOAP budget
		5.1.2.2 Engage influential people and celebrities		
		5.1.2.3 Showcase the complementary role of NSOAP in RMNCH and align with RMNCH priorities		
		5.1.2.4 Showcase role of SOA care as critical to treatment of NCDs and align with priorities in these areas		
	5.1.3 Advocate for SAO needs throughout Tanzania from the council level	**5.1.3.1** Ensure the joint Annual health sector review is sensitized to SOA needs.	Funds committed to SAO included in CCHPs	30% of annual NSOAP budget
		5.1.3.2 NSOAP representative/Coordinator to advocate for SOA needs at the TWG annual health sector review.		
		5.1.3.3 Speak through joint Annual health sector review and policy review meetings		
		5.1.3.4 Advocate for surgery inclusion in CCHPs		
	5.1.4 Advocate for new funding sources for SAO care	**5.1.4.1** Advocate for the establishment of a Trauma fund from motor insurance companies	Alternative funding sources secured (amount TZS)	
		5.1.4.2 Advocate for part of road fund for trauma care		
		5.1.4.3 Lobby for NHIF to allow funds to be used for purchase of surgical consumables		
	5.1.5 Match costs and reimbursement for surgical care for sustainable scale up	**5.1.5.1** Map costs of select SOA procedures across each zone/region	Proportion of full procedure costs being met by reimbursement and co-pay	All procedures
		5.1.5.2 Advocate for realistic reimbursements of SOA care from health insurance companies		
		5.1.5.3 Establish OOP/co-payment where reimbursement of full cost not achieved		
		5.1.5.4 Based on pricing index establish bundled payments for surgical services so patients can estimate full expense prior to receiving elective care		
	5.1.6 Develop partnerships with private providers and private enterprises to sponsor SOA programs	**5.1.6.1** Identify potential external and private funders	Funds committed to NSOAP activities from external partners	35% of total NSOAP budget
		5.1.6.2 NSOAP committee and MoF to approach external and private funders to advocate for funding of programs within the NSOAP		

Finance				
Strategic Objectives	**Outputs**	**Activities**	**Indicator**	**Target (2025)**
SO 5.2 Decrease catastrophic and impoverishing expenditure resulting from surgery	**5.2.1** Improve insurance coverage for surgical conditions	**5.2.1.1** Work with health insurance companies to ensure inclusion of core surgical procedures coverage with appropriate cost in universal health coverage package	% of the population protected from catastrophic financial risk due to surgery	70% of population protected
		5.2.1.2 Advocate to health insurance companies around the cost effectiveness of surgical care and its important role in attaining universal health coverage to make a case for coverage		
	5.2.2 Work with the social services department to sensitize communities about the cost of surgical conditions	**5.2.2.1** Develop strategy for community sensitization around the cost of SOA care and availability of insurance coverage		

6. Domain 6: Governance

SO 6.1 Disseminate NSOAP and sensitize stakeholders to content

Rationale
NSOAP will require robust governance to ensure it is implemented. As facilities and districts control their own budgets through their community health plans (CHPs) , advocating to the facility level for inclusion of SAO activities into CHPs will be crucial to successful implementation.
Relevant policies

- HSSP IV equally aims to improve governance, accountability and leadership within the health sector including at health facilities, RHMTs, Ministerial departments and within the Supply Chain.

SO 6.2 Establish accountability around implementation of the NSOAP

Rationale
A clear chain of accountability is required from facility level up to national level through designated staff. At the facility level, establishing a multidisciplinary NSOAP team to problem solve around SAO will improve teamwork and communication inside and outside the OR.

SO 6.3: Strengthen the capacity of professional societies in NSOAP implementation

Rationale
Professional societies have a strong role in ensuring that the views of front line clinicians continue to be represented throughout the implementation process. Officially defining their role in supervision and implementation will show a clear commitment to the NSOAP, the training of a new generation of professionals and improvement of the service that they provide.

SO 6.4 Ensure coordination of NSOAP implementation

Rationale:
As NSOAP gains attention multiple new partnerships will be formed. Coordination between these stakeholders will ensure that interventions occur with maximal impact and reduced duplication.

Table 8. Governance: Detailed Outputs, Activities, Indicators and Targets

Governance				
Strategic Objectives	**Outputs**	**Activities**	**Indicator**	**Target (2025)**
SO 6.1 Disseminate NSOAP and sensitize stakeholders to content	**6.1.1** All stakeholders made aware of content of NSOAP	**6.1.1.1** Distribute NSOAP to all hospital levels by MOHCDGEC and PORALG	NSOAP distributed to all facilities and publically available	Available by 2018
		6.1.1.2 Orientate Regional secretariats and local government authorities during national training days by MOHCDGEC and PORALG		
		6.1.1.3 Publish NSOAP on MOHCDGEC and PORALG website		
SO 6.2 Establish accountability around implementation of the NSOAP	**6.2.2** Identify specific NSOAP staff at each level of governance from national to facility level	**6.2.2.1** Appoint full-time national NSOAP coordinator in MOHCDGEC and PORLAG	National NSOAP coordinators in position at MOHCDGEC and PORALG with sustainable work plan until 2025	All facilities to have NSOAP governance by 2019
		6.2.2.2 Form national NSOAP section/ steering committee within MOHCDGEC	NSOAP steering committee appointed with sustainable TORs	
		6.2.2.3 Identify Regional and council NSOAP coordinator in each RHMT, CHMTs	Proportion of RHMTs and CHMTs with NSOAP coordinator co-opted	
		6.2.2.4 Establish a multidisciplinary theatre users committee of surgical care providers at each facility	Proportion of facilities with an active theatre users committee	
	6.2.3 Produce NSOAP quarterly and annual reports	**6.2.3.1** Integrate NSOAP indicators into national system for quality assurance star rating to be monitored by Quality Assurance team	Number of SOA indicators integrated into star rating system	Full integration by 2019
		6.2.3.2 NSOAP activities to be reviewed as part of the RMHT and quality assurance program quarterly reviews		
		6.2.3.3 NSOAP reports to be fed back through the appropriate channels to theatre user committee to drive quality improvement		
SO 6.3 Strengthen the capacity of professional societies in NSOAP implementation	**6.3.1** Professional societies to commit to support and implement NSOAP	**6.3.1.1** Professional associations to draft statement outlining their role in NSOAP implementation (For example: TSA, SATA, AGOTA, TANNA , TAMA, TOA)	Published statements from all relevant professional associations	Statements published by Dec 2018
		6.3.1.2 Professional organizations to nominate representative to sit on NSOAP national Committee	Number of professional associations represented on NSOAP steering committee	
SO 6.4 Ensure coordination of NSOAP implementation	**6.4.1** Ensure all surgical partnerships are captured within PORALG's health system strengthening resource center to improve coordination	**6.4.1.1** Ensure all NGOs wishing to implement SOA activities complete the standard registration form in Tanzania to be completed and submitted to PORALG resource center.	Proportion of SOA NGOs captured and feedback to the NSOAP coordinators	100%
		6.4.1.2 PORALG resource center to communicate with NSOAP coordinators on a monthly basis to ensure they are aware of all SOA activities		
SO 6.5 Ensure NSOAP costing is kept up to date	**6.5.1** Ensure Costs of NSOAP are kept up to date through regular review and recosting	**6.5.1.1** Recost NSOAP to reflect implementation progress, past expenditure and true costs		

Chapter 7: Monitoring and Evaluation Framework

In order to monitor surgical capacity at a facility and national level and measure the impact of the NSOAP, a monitoring and evaluation framework must be developed.

The Lancet Commission on Global Surgery, G4 Alliance and WHO recommend that the following data should be reported to help implement the NSOAP and monitor its impact:

1) **Surgical volume**
    a. The standard surgical logbook should be amended for reporting of case volume, case mix, risk adjustment factors, grade of provider. (see appendix)
    b. This should be reported monthly and tracked via HMIS to a national level
    c. This should be tracked at a facility level and reported the monthly NSOAP meeting
    d. The grade of the person performing surgery should be tallied to gain an understanding of what providers are contributing to providing surgery in Tanzania.
2) **Perioperative Mortality**
    a. Perioperative mortality should be tracked and reported at a district, regional and national level.
    b. Data collection for risk adjustment should occur in the surgical logbook
    c. Perioperative Mortality should be split between deaths on the day of surgery and deaths post 24hrs
    d. Monthly NSOAP meeting should review surgical volume and perioperative mortality and complications.

3) **2-hour access to emergency surgical services (bellwether procedures)**
    a. Monitor number of facilities providing bellwether procedures
    b. Once established, surgical volume data and surgical referral app data can be used to track service delivery at each facility in real time
    c. Open source modelling software to be used to establish proportion of the population with 2hr access to surgical services on a yearly basis.

4) **Surgeon Anaesthesiologist and Obstetrician density**
    a. Specialist graduating and practicing numbers can be reported annually to the electronic HRH tracking system.
    b. The ratio of surgeon: anaesthesiologist should be calculated and reported nationally
    c. Nurse anaesthesiologist, medical officers providing surgery and other non-physician clinicians performing surgery should be reported up to national level.

5) **Catastrophic and Impoverishing expenditure**
    a. Average cost of 3 Bellwether procedures should be reported bi-annually to generate the regional cost index.
    b. This information can be used with open source software to estimate the proportion of the population at risk of catastrophic expenditure from surgery

6) **Proportion of seriously injured patients transported by ambulance**
    a. Trauma registries at each facility should track the mode of transport for each admitted patient
    b. Numbers should be tallied and submitted regionally and then collated for national reporting

7) We recommend that, at each facility, the newly formed NSOAP multidisciplinary team define additional facility level indicators to target for Quality Improvement. These should be collated and fed back at the monthly NSOAP meeting to motivate change in the surgical system. Suggested metrics include:
    a. Decision to incision time for C-section and other emergency surgical procedures
    b. Blood availability intra-operatively
    c. Use of WHO checklist
    d. Surgical site infection
    e. Rate of cancellation of elective surgery
    f. Inpatient trauma mortality rate
    g. Surgical patient satisfaction
    h. Rate of on-time start for first case of the day
    i. Anaesthetic adverse event rate
    j. Staff turnover rate
    k. C-section rate
    l. % of cases using pulse oximetry
    m. % of cases where appropriate pre- or intra-operative antibiotics are given at the approved time

Chapter 8: Governance Framework

Effective leadership and governance will be key to successful implementation of the Tanzania NSOAP which requires coordination amongst broad range of stakeholders. A clear chain of accountability must be established at all levels from facility teams up to the national level at the MOHCDGEC and PORLAG.

National

MOHCDGEC AND PORALG:

Within the MOHCDGEC the initiative will be led by The Minister of Health. The NSOAP will be integrated into the department of curative services within the MOHCDGEC. It will be the responsibility of MOHCDGEC to create a robust NSOAP in line with existing priorities detailed in the National Health Policy.

The role of the quality department of MOHCDGEC will be to oversee and provide quality assurance of the implementation of NSOAP against key benchmarks via the quality directorate.

NSOAP Steering Committee:

A steering committee will be responsible for overseeing the overall direction of the NSOAP implementation comprised of PORALG and MOHCDGEC members as well as members of professional associations, regional representatives, implementing partners, civil society.

This steering group will be responsible for

- Supervision, monitoring and evaluation of the activities
- Feedback around the NSOAP
- Prioritisation of NSOAP activities once a budget is established
- Establishing details of each program within NSOAP once funding is allocated

A project sub-committee, within the steering committee, will be the engine for implementation of NSOAP.

The steering committee will appoint two full time NSOAP coordinators from MOHCDGEC and one from PORALG.

The Quality Assurance Team

- The NSOAP steering committee will have one representative from the Quality assurance team who will coordinate closely with the NSOAP coordinator.
- The Quality Assurance NSOAP representative will be responsible for:
    - Ensuring NSOAP supervision is integrated into inspection visits and other quality activities with local PORLAG CHMT/RMHT.
    - Reporting NSOAP supervision results back to the NSOAP steering committee, DPP and other necessary channels.

Regional

Regional Health Management team

- Each regional health management team should designate an NSOAP representative to oversee and coordinate the implementation of NSOAP
- The regional health management team will be responsible for:
    - The collection of NSOAP M&E data from the district
    - Reporting of national surgery, anaesthesia and obstetric indicators to the national level (DPP)
    - Facility visit to supervise NSOAP implementation

- RHMT will be responsible for collating and disseminating best practice information between NSOAP sites

Regional professional mentors

- Each region will assign a surgeon, anaesthesiologist, obstetrician, and an OR nurse mentor to deliver supportive supervision visits quarterly to lower level facilities providing surgical care
- During their visits, they will discuss the facility NSOAP plan and help problem solve around and action the plan

District

Community Health Management team.

- Each Community Health management team should nominate an NSOAP representative to coordinate the NSOAP implementation at the facility level
- The district NSOAP designee will be responsible for:
  - Arranging training around NSOAP content
  - Receiving and collating data from the facility level around NSOAP implementation
  - Reporting NSOAP data to the Regional NSOAP designee

Facility level

Facility director/CEO

The hospital/ health center director/CEO will be responsible for

- Oversight of NSOAP activities
- Setting up and monitoring with baseline and ongoing data collection activities at the facility level
- Assigning a NSOAP champion member of the surgical team responsible for moving the NSOAP agenda forward
- Assign OR manager
- Engage other senior members of the hospital in leadership around NSOAP
- Allocate and mobilize resources for NSOAP agenda
- Ensure availability of necessary supplies
- Ensure inclusion of NSOAP in facility health plan
- Oversee the development of a facility NSOAP plan that reflects the priorities of the facility and how surgical and anaesthesia services will be improved.

NSOAP surgical team champion

Each facility providing surgical services will have an identified an NSOAP champion responsible for implementing NSOAP at their facility. The NSOAP champion will be responsible for:

- Mobilizing and motivating the facility surgical team (clinical and non-clinical) around NSOAP activities and ensuring that the surgical team works together and feels valued.
- Developing a NSOAP specific action plan for the facility which will be reviewed by the hospital director
- Supporting the implementation of the NSOAP action plan
- Coordinating collection of surgical monitoring data
- Coordinating, with the Quality Improvement Team (QIT) at the facility, to ensure that NSOAP recommendations are implemented
- Arranging internal surgical team conferences to discuss mortality and morbidity, review surgical data monthly and discuss opportunities for quality improvement around surgery.
- Providing training to clinical and non-clinical surgical staff

NSOAP Surgical team

- All members of the facility involved in provision of surgical, anaesthesia, and obstetric services, including clinical and non-clinical staff, will belong to the NSOAP surgical team
- The NSOAP surgical team will be led by the NSOAP champion and the surgical, anaesthesia, and obstetrics staff
- They will be responsible for contributing towards the development of a facility specific NSOAP plan
- The NSOAP team will be responsible for attending and feeding back information during the monthly feedback meeting
- The NSOAP team will collect relevant data for the NSOAP and provide this information to the Quality Improvement Team (QIT) at the facility

OR manager will:

- Act as secretary for the NSOAP surgical team
- Oversight of day to day activity of OR
- Identify any issues to escalate to the NSOAP facility team.
- Along with the NSOAP champion, represent surgery to the senior management of the hospital.

Non-governmental stakeholders:

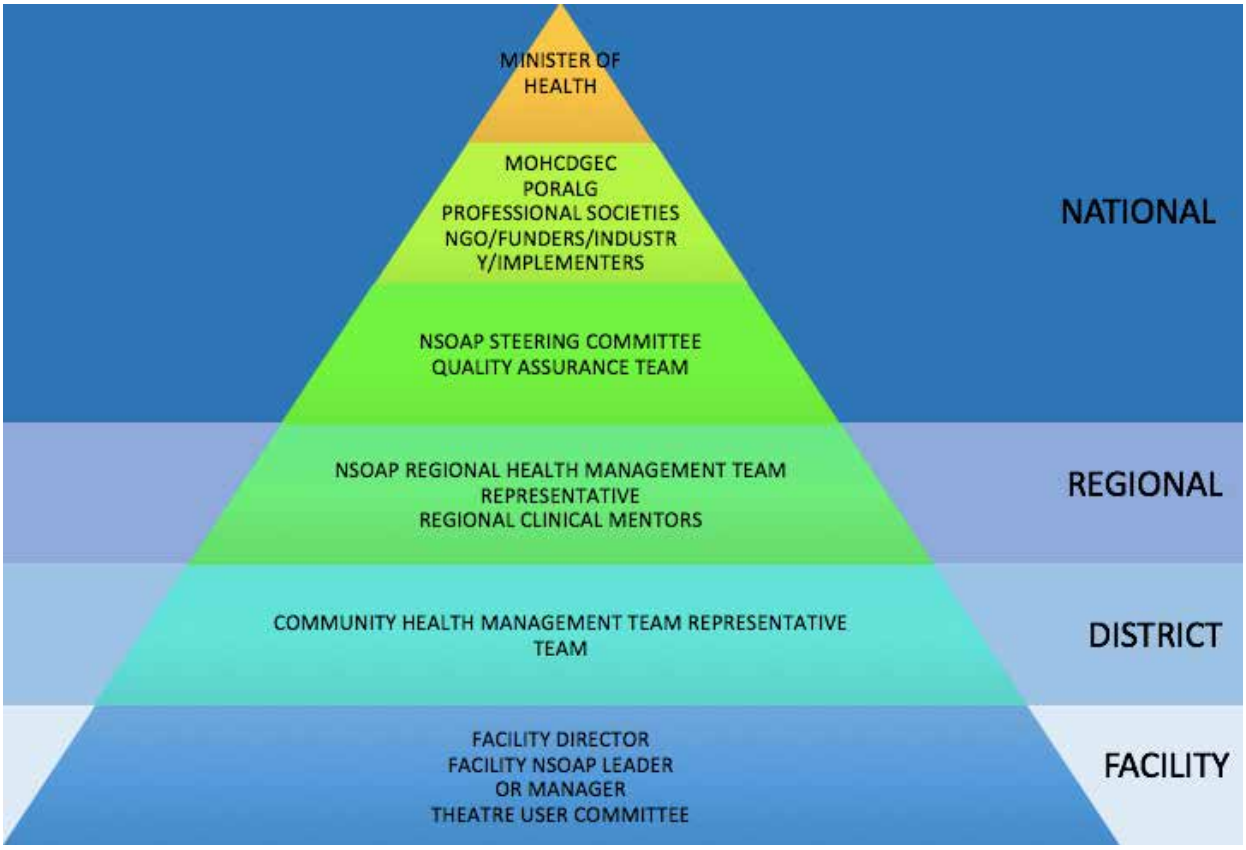
Professional societies will:

- Provide evidence based guidelines for surgical and anaesthesia services
- Advocate around the NSOAP to their members via newsletters/congress/meetings
- Provide quality assurance around education and continuing professional education
- Develop curricula for training programs

NGOs and implementing partner organizations along with industry will:

- Ensure that their projects are aligned with the priorities set out in the NSOAP
- Coordinate with the NSOAP steering committee to ensure coordination between activities and avoid duplication
- Coordinate with the PORALG health systems strengthening resource center and RMOs to be sure that resources across NSOAP and other sectors are being fully leveraged and captured.

Figure 8. Governance hierarchy of NSOAP



Chapter 9: Dissemination and Advocacy

The plan will be launched and disseminated via hard and soft copies to the Zonal, regional, district, and health center teams and facilities. It will be published in the MOHCDGEC website.

Zonal and national hospital directors and NSOAP teams will be briefed on NSOAP following the launch directly by the NSOAP coordinator.

The regional health management teams will be briefed on NSOAP by the PORALG NSOAP coordinator. The RHMTs will then be responsible for promoting NSOAP at the district and facility level through designated training.

The NSOAP steering committee chairs will be responsible for advocating for the plan's adoption through parliament and its inclusion into the annual budget.

The NSOAP chairs, coordinators, advocates, DPG representatives and implementing partners will be responsible for advocating for resources for the NSOAP amongst funding bodies and funding partners.

Chapter 10: Costing of Activities

1. NSOAP Costing Methods

Costing of the NSOAP is an important step in the planning and implementation process to plan resource allocation from domestic national government, local government and facility budgets as well as to seek funding from external sources. Costing of the NSOAP was led by the Directorate of Curative Services and Directorate of Policy and Planning the Program in Global Surgery and Social Change. Additional cost information was kindly provided from many other MOHCDGEC and PORALG departments as well as NGOs and expert communications. Where Tanzanian specific costing information was unavailable, costs were sourced from global costs or the relevant literature. In order to obtain the most accurate cost estimates, activities already accounted for by other government policies and strategic plans were omitted from the costing. Costing was undertaken to align with the implementation timeframe which prioritizes rehabilitating elective SOA service delivery at national, zonal and regional hospitals and essential and emergency SOA service delivery at district hospitals and health centers.

An assumption is made that the plan will be re-costed in 2020 to incorporate updated projections based on past expenditure, implementation progress and true costs of implemented activities. The total cost of the plan over the seven-year period is $597,042,037 USD representing an investment of less than $2USD per capita per annum or 3.28% of total per capita health spend.

2. Key assumptions

Funding sources

- All NSOAP activities to be implemented were costed irrespective of funding sources. Total activity costs are listed. These costs will be divided between National (MOHCDGEC), Regional and Local government (PORALG) budgets, facility budgets and external funding sources.

Facility numbers:

- The cost sharing between the government, private and faith-based facilities is complex and individual to each facility. As such, this document details full costs for all designated district, regional and zonal hospitals regardless of management.

- The NSOAP focuses on expansion of services at 100 CEmONC-upgraded health centers. This number may rise in the future and have to be accounted for in future costing updates of the NSOAP.
- The number of facilities used for this costing are listed below based on public and public-designated facilities currently being serviced by the Medical Stores Department (MSD).
- Throughout the document, six zonal hospitals are budgeted for although only four zonal hospitals currently provide surgical services. This is based on the recommendation that two additional hospitals (in zones which currently do not have a zonal hospital) should be nominated and upgraded as fully functional surgical centers to provide the SOA services at zonal level capacity. These two upgraded fully functional surgical centers will have the same SOA running costs are zonal hospitals.

Table 9. Facility numbers used in costing projections based on number of facilities currently being serviced by MSD

Number of facilities used in the costing	
Upgraded health centers	100
District hospital	123
Regional	39
Zonal	4
Special (MOI, Jakaya Kikwete Cardiac Institute)	2
National	1
Total	269

Infrastructure

- The total cost required to purchase, construct and/or upgrade all relevant equipment and infrastructure for a facility level was calculated.
- The costs were then scaled to the proportion of facilities at each level requiring infrastructure purchase, construction and/or upgrade, based on estimates from expert advice from the Department of Curative Services.
- An additional 30% of final costs was added to all equipment to account for shipping, installation, maintenance and tax costs.

Salaries

- All costs are provided as per current MOHCDGEC scales

Training costs

- Costs were averaged between public and private facility costs obtained from MUHAS and KCMUCo

Travel costs

- Travel costs were taken as a weighted average of the cost of travel from different locations within Tanzania using public, private and air transportation.

Inflation

- Inflation is factored into the total cost per year at 7.5% per annum
- The projected inflation in Tanzania until 2022 is 5% per annum in line with the previous 4 years[1]. This higher, more conservative estimate was chosen to allow for excess inflation as well as exchange rate fluctuations.

Table 10. Summary of NSOAP implementation cost by year and domain

NSOAP Domain	Implementation cost per Fiscal Year (TZS; 1,000s)							Cost per domain (TZS; 1,000s)	Cost per domain (USD)
	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25		
Service Delivery	644,348	940,209	2,271,394	2,733,400	2,947,029	3,190,844	3,713,424	**17,244,941**	**7,691,767**
Infrastructure	14,144,242	75,529,387	162,062,015	143,113,859	111,459,714	95,134,276	17,362,174	**618,805,668**	**276,006,096**
Human Resource	25,348,207	32,445,908	43,063,465	55,551,415	62,112,857	72,751,255	94,880,662	**386,153,769**	**172,236,293**
Information Management and Technology	1,172,071	3,848,739	2,702,933	3,549,224	2,565,856	3,561,152	2,680,111	**20,080,087**	**8,956,328**
Finance	183,895	776,885	284,300	251,885	72,535	251,885	72,895	**1,894,280**	**844,906**
Governance	470,514	347,520	373,234	383,124	383,124	347,520	435,514	**2,757,336**	**1,229,855**
Total (TZS)	**41,963,277**	**113,888,648**	**210,757,341**	**205,582,908**	**179,541,116**	**175,236,931**	**119,144,781**	1,046,936,080	466,965,245
Total (USD)	**18,716,894**	**50,797,791**	**94,004,166**	**91,696,212**	**80,080,783**	**78,160,986**	**53,142,186**	466,965,245	
Total (TZS) @ 7.5% inflation	**41,963,277**	**122,430,296**	**243,556,452**	**255,395,004**	**239,771,620**	**251,575,278**	**183,876,322**	**1,338,568,247**	
Total (USD) @ 7.5% inflation	**18,716,894**	**54,607,625**	**108,633,565**	**113,913,918**	**106,945,415**	**112,210,204**	**82,014,417**	**597,042,037**	

Table 11. Costing of NSOAP Service Delivery Activities

Service Delivery		Implementation Timeframe (TZS; 1,000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS; 1,000s)**	**Total Cost (USD)**
1.1.1 Establish and strengthen the provision of quality essential and emergency surgical, anaesthesia, obstetric and critical care services at national, zonal, district and health center levels	1.1.1.1 Develop policy guidelines defining essential emergency and elective procedures at each level	18,563							**18,563**	**8,279**
	1.1.1.2 Develop and update policy guidelines to define workforce and infrastructure needs to provide services listed in 1.1.1.1	14,890							**14,890**	**6,641**
	Implement recommended workforce and infrastructure guidelines as per 1.1.1.2 to ensure delivery of:									
	1.1.1.3 Minor surgery at all levels	Refer to workforce and infrastructure								
	1.1.1.4 Basic general emergency surgery anaesthesia and obstetric care at health centers and above	Refer to workforce and infrastructure								
	1.1.1.5 Emergency and elective surgical, anaesthesia and obstetric care at district hospitals and above	Refer to workforce and infrastructure								
	1.1.1.6 Basic emergency orthopaedic surgery at health center and above (open fracture washout and closed fracture reduction)	Refer to workforce and infrastructure								
	1.1.1.7 Advanced orthopaedic emergency (open fracture repair) and elective orthopaedic surgery at regional level and above	Refer to workforce and infrastructure								
	1.1.1.8 Basic maxillofacial emergency procedures at the district level (e.g non displaced facial fractures, primary debridement and cleaning)	Refer to workforce and infrastructure								
	1.1.1.9 Advanced emergency and elective maxillofacial surgery (e.g open facial fractures, Lefort 1 advancements) at zonal hospitals and fully functional regional surgical centers	Refer to workforce and infrastructure								
	1.1.1.10 Basic urological emergencies at the health center level and above (e.g urinary obstruction and suprapubic catheterisation)	Refer to workforce and infrastructure								
	1.1.1.11 Advanced urological emergencies (ureteric obstruction) and elective urological surgery (e.g prostatectomies) at regional level and above	Refer to workforce and infrastructure								
	1.1.1.12 Basic neurosurgical emergencies (eg. Burr holes) at district level and above	Refer to workforce and infrastructure								

Service Delivery		Implementation Timeframe (TZS; 1,000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS; 1,000s)**	**Total Cost (USD)**
	1.1.1.13 Full neurosurgical services at the zonal level and fully functional surgical centers	Refer to workforce and infrastructure								
	1.1.1.14 Plastic and reconstructive surgery at zonal hospitals and fully functional surgical centers	Refer to workforce and infrastructure								
	1.1.1.15 Zonal hospitals and above to provide interventional radiology services	Refer to workforce and infrastructure								
	1.1.1.16 Intensive monitoring of the critical and/or post operative patient at all facilities	Refer to workforce and infrastructure								
	1.1.1.17 Basic emergency resuscitation and stabilisation of the critically unwell patient at all facilities	Refer to workforce and infrastructure								
	1.1.1.18 ICM level 2 at the district level for ongoing critical care monitoring	Refer to workforce and infrastructure								
	1.1.1.19 ICM level 3 and level 4 at the regional level and above	Refer to workforce and infrastructure								
1.1.2 Ensure that in each zone there is at least one hospital providing the full package of zonal SOA services	1.1.2.1 Select regional hospitals to be upgraded to fully functional surgical centers providing the services expected at zonal level	14,818							**14,818**	**6,609**
	1.1.2.2 Upgrade the selected 2 regional hospitals to fully functional surigcal centers to provide full spectrum of SOA service delivery expected at a zonal hospital and ensure readiness for ECSA training center requirements […]	Refer to workforce and infrastructure								
	1.1.2.3 Upgrade capacity of current zonal hospitals to full expected SOA service delivery	Refer to workforce and infrastructure								
1.1.3 Increase access and availability of CEmONC services	1.1.3.1 Support all activities around CEmONC expansion and work directly with One Plan II	NSOAP Coordinator time								
	1.1.3.2 Ensure inclusion of NSOAP representatives on RMNCH working group and activities to ensure coordination	NSOAP Coordinator time								
1.2.1 Develop and implement national surgical referral guidelines	1.2.1.1 Develop National SOA referral framework which can be adapted and operationalized for each region and harmonized with existing guidelines	27,890	27,890						**55,780**	**24,880**
	1.2.1.2 Each NSOAP regional coordinator and RMOs to form a task force, to lead regional reviews of safe surgical capacity at all facilities	311,920			335,760			335,760	**983,440**	**438,644**
	1.2.1.3 Each regional taskforce (RMO office-led) adapts national guidelines for regional	201,388							**201,388**	**89,825**

Service Delivery		Implementation Timeframe (TZS; 1,000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS; 1,000s)**	**Total Cost (USD)**
	referral pathway for surgery including which surgeries should be referred where and when									
	1.2.1.4 Ensure SOPs for closed-loop feedback of referrals to and from facilities is included in regional referral framework	See 1.2.1.3								
1.2.2 Ensure a functioning closed-loop referral system	1.2.2.1 Improve current paper-based surgical referral system	29,190	93,173	93,173					**215,535**	**96,135**
	1.2.2.2 Explore and pilot electronic closed-loop referral system and ensure compatibility with existing system as per the National eHealth strategy		575,000	345,000	299,000	391,000	575,000	345,000	**2,530,000**	**1,128,457**
	1.2.2.3 Ensure integration of services from public, private and faith based organisations into tracking system to ensure most efficient use of all available providers.	See 1.2.2.2								
	1.2.2.4 Develop workforce and infrastructure capacity to maintain and analyze data from referral system		61,860	61,830	61,830	61,830	61,830	61,830	**371,010**	**165,482**
1.2.3 Strengthen ambulance and transportation services	1.2.3.1 Support activities around ambulance transport from One Plan II […]	See one Plan II								
	1.2.3.2Review and update minimum standards for patient ambulatory care		21,590						**21,590**	**9,630**
	1.2.3.3.Train personel (driver, paramedic) on use of ambulances and transportation of patients		2,160	7,800	7,800	7,800	7,800	7,800	**41,160**	**18,359**
	1.2.3.4 Advocate for funding from CHF and other reimbursement mechanisms for patient transport		3,673		120	120	120	120	**4,153**	**1,852**
	1.2.3.5 Establish regional emergency contact phone numbers		121,730	183,885	435,210	878,625	910,590	1,327,410	**3,857,450**	**1,720,540**
1.3.1 Develop national guidelines and standardized operating procedures for SOA procedures	1.3.1.1 Define and map needed guidelines for surgical procedures	3,673							**3,673**	**1,638**
	1.3.1.2 NSOAP working group to work with professional associations to review and update national treatment guidelines in collaboration with the MOHCDGEC	22,018	22,018	22,018	22,018	22,018	22,018	22,018	**154,123**	**68,743**
	1.3.1.3 NSOAP working group, Quality Assurance team, professional associations and frontline workers to collaborate and develop SOPs for SOA procedures at each level			7,273	7,273	7,273	7,273	7,273	**36,363**	**16,219**

Service Delivery		Implementation Timeframe (TZS; 1,000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS; 1,000s)**	**Total Cost (USD)**
1.3.2 Ensure the use of surgical checklists at national, zonal, district and upgraded health center levels	1.3.2.1 Review available validated checklists around SOA care	See 1.3.1.1								
	1.3.2.2 Conduct training and support use of SOA checklists		9,316	9,316	23,290	37,264	65,114	65,114	**209,414**	**93,405**
1.4.1 Increase frequency and formalize the schedule for community outreach and rural surgical missions	1.4.1.1 Each region in conjunction with NSOAP representative, professional association and RMO to create schedule for surgical missions to lower levels of care around treatable non-emergency conditions (e.g hydrocoele, hernia, cataract) to eliminate backlog and deliver supportive supervision			1,501,500	1,501,500	1,501,500	1,501,500	1,501,500	**7,507,500**	**3,348,573**
	1.4.1.2 Develop a curriculum and schedule for community outreach to educate on surgical conditions, surgical care availability and financing options		1,800	39,600	39,600	39,600	39,600	39,600	**199,800**	**89,117**
1.5.1 Develop and implement national guidelines and SOPs for Intensive Care Medicine (ICM) at each health facility level	1.5.1.1 Review and update service delivery guidelines outlining the level of ICM services for each level of care	24,390							**24,390**	**10,879**
	1.5.1.2 Develop guidelines and implement SOPs for critical care admission and care		10,182	10,182	14,400	14,400	14,400	45,360	**108,923**	**48,583**
1.5.2 Provide in-service training for critical care services at all hospital levels	1.5.2.1 Review existing SOA partnerships and expand exchanges to other hospitals and hospital levels	4,945	2,836	2,836	2,836	2,836	2,836	2,836	**21,961**	**9,795**
	1.5.2.2 Ensure critical care supervision is included in supportive supervision models	1,200	1,200	129,324	129,324	129,324	129,324	129,324	**649,020**	**289,483**
Total Resources required for Service Delivery		**644,348**	**940,209**	**2,271,394**	**2,733,400**	**2,947,029**	**3,190,844**	**3,713,424**	**17,244,941**	**7,691,767**

Table 12. Costing of NSOAP Infrastructure Activities

Infrastructure		Implementation Timeframe (TZS; 1,000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS; 1,000s)**	**Total Cost (USD)**
2.1.1 Develop and implement minimum infrastructure and equipment standards guidelines	2.1.1.1 MOH in collaboration with TSA, SATA, AGOTA as well as BMET experts to review minimum SOA infrastructure […]	59,110				59,310			**118,420**	**52,819**
	2.1.1.2 Audit available infrastructure and equipment to identify gaps	See 1.2.1.2								
	2.1.1.3 Each district to generate and implement an equipment plan to procure the infrastructure required for safe service delivery	56,580			56,580			56,580	**169,740**	**75,709**
	2.1.1.4 Plans should include reallocation of unsued equipment for most efficient use	See 2.1.1.3								
2.1.2 Equip upgraded health centers, district, regional, national level hospitals to provide all SOA procedures as recommended by NSOAP committee	2.1.2.1 Councils and facilities develop a budget for procurement of SOA infrastucture equipment and supplies as defined in 2.1.1	See 2.1.1.3								
	2.1.2.2 Procure required equipment to meet recommendations in 2.1.1.1	*assume: 20% of zonal hospitals, 30% of regional hospitals, 50% of district hospitals required equipment and infrastructure to be procured/upgraded								
	2.1.2.2.1 Procure required equipment for National hospitals to meet recommendations in 2.1.1.1	3,050,539	3,050,539						**6,101,078**	**2,721,266**
	2.1.2.2 2 Procure required equipment for zonal hospitals and fully functional surgical centers to meet recommendations in 2.1.1.1		6,101,078	6,101,078					**12,202,156**	**5,442,532**
	2.1.2.2.3 Procure required equipment for regional hospitals to meet recommendations in 2.1.1.1		25,253,204	25,253,204					**50,506,409**	**22,527,390**
	2.1.2.2.4 Procure required equipment for district hospital to meet recommendations in 2.1.1.1			9,557,177	9,557,177	9,557,177	3,185,726		**31,857,255**	**14,209,302**
	2.1.2.2.5 Procure required equipment for upgraded health				920,000	1,380,000	1,380,000	920,000	**4,600,000**	**2,051,740**

Infrastructure		Implementation Timeframe (TZS; 1,000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS; 1,000s)**	**Total Cost (USD)**
	centers to upgrade from CEMONC only to full essential surgical care to meet recommendations in 2.1.1.1									
	2.1.2.3 Procure environment appropriate anaesthesia sets for each health facility level	4,758,645	4,758,645	4,758,645	4,512,025	1,933,725			**20,721,685**	**9,242,500**
2.1.3 Equip upgraded health centers already providing CEmONC to provide surgical services appropriate to their level of care	2.1.3.1 Define items necessary to upgrade from CEmONC to basic surgical services at upgraded health facilities in collaboration with end users	See 2.1.6.6							**0**	**0**
	2.1.3.2 Procure standard equipment needed for upgrade to surgical care expected for health center level	See								
2.1.4 Operationalize IPC guidelines at facilities providing SOA services	2.1.4.1 Support standards for health waste management as per WASH guidelines	2,573							**2,573**	**1,147**
	2.1.4.2 Create facility based waste management committee as per WASH guideline	See 2.1.4.1								
	2.1.4.3 Ensure all health facilities have recommended health waste management infrastructure on site in all new constructions	See 2.1.1.1								
2.1.5 Ensure all facilities providing SOA services have access to laundry services	2.1.5.1 Define laundry management standards and equipment at each health facility level	See 2.1.1.1								
	2.1.5.2 Upgrade all health facilities with recommended laundry management infrastructure (*Assume need to upgrade 30% of laundry at zonal, 40% of laundries at regional and 50% of laundries at district and below)		2,585,200	2,585,200	1,380,000	1,380,000	460,000		**8,390,400**	**3,742,373**
	2.1.5.3 Disseminate guidelines on recommended laundry management protocols at each health facility level		4,060						**4,060**	**1,811**
2.1.6 Enforce guidelines around equipment	2.1.6.1 Ensure all procurement occurs with Planned	See 2.1.7.2								

Infrastructure		Implementation Timeframe (TZS; 1,000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS; 1,000s)**	**Total Cost (USD)**
purchasing regarding maintenance contracts and service training	Preventative Maintenance (PPM) contracts									
	2.1.6.2 Orientate procurement team around current equipment purchasing guidelines and model contracts	100,264		100,264		100,264		100,264	**401,056**	**178,883**
	2.1.6.3 Engage private industry suppliers to provide training on maintenance packages/contracts available	NSOAP Coordinator time								
2.2.1 Upgrade and equip radiology and radiography equipment at each level of care to support safe SOA services	2.2.1.1 Audit current radiography equipment and identify gaps	See activity 2.1.1.2								
	2.2.1.2 Equip all upgraded health centers, and above to provide ultrasound and x-ray imaging services (* Assume 20% of regional hospitals, 50% of district hospitals and 100% upgraded health centers require X-ray. All upgraded health centers have ultrasound costed within One plan II)	5,553,979	5,529,129	9,287,613	6,231,060	4,702,784	4,702,784	4,702,784	**40,710,134**	**18,157,954**
	2.2.1.3 Equip all regional and zonal hospitals with CT scanners			38,122,500	38,870,000	29,900,000	26,910,000		**133,802,500**	**59,679,973**
	2.2.1.4 Equip all zonal hospitals to provide MRI imaging services			17,940,000	17,940,000				**35,880,000**	**16,003,568**
2.2.2 Upgrade and equip laboratory services appropriate for each facility level to support SOA services	2.2.2.1 Define and procure necessary laboratory equipment relevant to perform the procedures for each level of care (* Assume 20% of regional and zonal hospital, 50% of district hospitals and 100% upgraded health centers equipment requires uprading)	7,600	8,754,045	16,492,850	14,730,548	10,018,305	11,493,275	7,662,184	**69,158,807**	**30,846,925**
	2.2.2.2 Upgrade all zonal hospitals and fully functional surgical centers to have access to histopathology services	See 2.2.2.1								

Infrastructure		Implementation Timeframe (TZS; 1,000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS; 1,000s)**	**Total Cost (USD)**
	2.2.2.3 Ensure all lower-level services have a clear referral pathway for escalating specimens and receiving reports	32,708							**32,708**	**14,589**
2.2.3 Upgrade and equip sterilization services appropriate for each facility level to support SOA services	2.2.3.1 Define and procure necessary sterilization equipment for the health center level and above (*Assume upgrade required in 60% of district hospitals and health centers, 40% of regional, 40% zonal and 20% national)	269,100	1,219,920	1,363,440	897,000	897,000	897,000	358,800	**5,902,260**	**2,632,587**
	2.2.3.2 Provide in-service instrument sterilization training to hospital staff	189,540		189,540		189,540		189,540	**758,160**	**338,162**
2.2.4 Upgrade and equip Intensive care medicine (ICM) services at health facilities per national guidelines	2.2.4.1 Construct, upgrade and equip ICM units at district , zonal and national levels		16,127,004	25,008,581	42,876,297	42,876,297	41,170,318		**168,058,497**	**74,959,187**
2.3.1 Ensure consistent availability of medical oxygen to all health facilities providing SOA services	2.3.1.1 Construct sustainable high volume oxygen plants for each zonal level hospital to supply oxygen to their catchment hospitals			3,080,000	3,080,000	6,160,000	3,080,000	3,080,000	**18,480,000**	**8,242,640**
	2.3.1.2 Ensure availability of functional oxygen concentrators at all facility levels	Costed in 2.1.5.2								
	2.3.1.3 Ensure availability of oxygen equipment such as cylinders, gauge, flowmeters, piping, facemasks, pulse oximetry at all health facility levels	See 2.3.1.1								
2.3.2 Ensure facilities providing SOA services have reliable access to safe running water	2.3.2.1 Support existing guidelines "Basic Standards for Health Social Welfare Facilities"	-								
	2.3.2.2 Provide access to safe piped water for all health facilities providing SOA services as per "Basic Standards for Health Social Welfare Facilities"	-								

Infrastructure		Implementation Timeframe (TZS; 1,000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS; 1,000s)**	**Total Cost (USD)**
	2.3.2.3 Provide clean water backup (sufficient for 2 days) for operating theatres separate from the rest of the facility		345,000	345,000	345,000	345,000	345,000	131,100	**1,856,100**	**827,877**
2.3.3 Ensure all health facilities providing SOA services have reliable and consistent access to electricity	2.3.3.1 Ensure all facilities providing surgical and critical care services have 24/7 reliable electricity supply	Cross sectoral costing								
	2.3.3.2 Ensure all operating suites have at at least one alternative electricity backup source (automatic generators, solar power) (*Assume 100% of upgraded health centers and 50% of district hospitals need an additional backup generators)		1,716,000	1,716,000	1,716,000	1,716,000	1,508,000		**8,372,000**	**3,734,166**
	2.3.3.3 Ensure recommended generators are automatic as part of basic equipment for all new operating rooms									
2.4.1 Ensure constant availability of necessary consumables at all health facilities providing SOA services	2.4.1.1 Working group including members of professional associations as well as BMET experts to review essential drug list and a minimum consumable list to include drugs and consummables for SOA care and review with Health Technology Working Group	19,490							**19,490**	**8,693**
	2.4.1.2 Track availability of minimum consumables at each facility providing SOA services through eLMIS	2,173	2,173	2,173	2,173	2,173	2,173	2,173	**15,208**	**6,783**
	2.4.1.3 Each facility develops an escalation plan to report and solve stockout challenges	NSOAP coordinator time								
	2.4.1.4 Track reduced service delivery resulting from lack of access to consumables using referral tools	See 1.2.2.1 and 1.2.2.2								
	2.4.1.5 Train OR nurse managers on surgical consumable Forecasting and			124,480		124,480		124,480	**373,440**	**166,566**

Infrastructure		Implementation Timeframe (TZS; 1,000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS; 1,000s)**	**Total Cost (USD)**
	Quantification									
2.5.1 Implement guidelines for medicines and medical supplies donations	2.5.1.1- Review current donation and disposal guideline to include surgical and medical equipment	7,672							**7,672**	**3,422**
	2.5.1.2 Provide training at facility level in public, faith based and private hospitals with appropriate staff to sensitise to current guidelines and implement the donation checklist	34,270		34,270		34,270		34,270	**137,080**	**61,142**
	2.5.1.3 Encourage reallocation of equipment between facilities approved by the RMO to ensure most efficient deployment of available resources	See 2.1.1.4								
	2.5.1.4 Ensure all purchased or donated quipment have appropriate training on maintenance and repair for facility and regional biomedical technicians	See 2.5.1.1								
2.6.1 Ensure adequate availability of safe blood to all facilities doing SOA procedures	2.6.1.1 Increase the number of units of blood collected	See NBTS guidelines								
	2.6.1.2 Advocate and budget for voluntary blood donation, collection and transportation at the district level, in collaboration with NBTS	See NBTS guidelines								
	2.6.1.3 Councils to mobilize funds for screening and testing of donated blood	See NBTS guidelines								
	2.6.1.4 Facilities to budget for proper storage of blood and blood products	See NBTS guidelines								
2.6.2 Implement the NBTS clinical guidelines for appropriate use of blood and blood products	2.6.2.1 Train all SOA providers on the NBTS clinical guidelines on appropriate use of blood and blood products		83,390			83,390			**166,780**	**74,389**
	2.6.2.2 Establish a data system for monitoring the utilization, unmet need and wastage of blood	See NBTS guidelines								

Infrastructure		Implementation Timeframe (TZS; 1,000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS; 1,000s)**	**Total Cost (USD)**
2.7.1 Each facility to have a BMET and preventive maintenance plan	2.7.1.1 Ensure each facility providing SOA care has a preventative maintenance plan, that is budgeted	See 2.1.7.2								
	2.7.1.2 Strengthen managerial capacity with regard to preventative maintenance	See 2.1.7.2								
	2.7.1.3 Explore contractual agreements with equipment providers, which include maintenance, and assess its cost-effectiveness	See 2.1.7.2								
Total Resources required for infrastructure		**14,144,242**	**75,529,387**	**162,062,015**	**143,113,859**	**111,459,714**	**95,134,276**	**17,362,174**	**618,805,668**	**276,006,096**

Table 13. Costing of NSOAP Human Resource Activities

Human Resource		Implementation Timeframe (TZS, 1000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS, 1,000s)**	**Total Cost (USD)**
3.1.1 Decrease financial barriers to entry for SOA workforce, especially those who will work in rural areas	3.1.1.1 Ensure sponsorship for at least one anaesthesiologist from each region (n=26) per year	1,120,990	1,120,990	1,120,990	1,120,990	1,120,990	1,120,990	1,120,990	**7,846,930**	**3,499,969**
	3.1.1.2 Train and graduate 200 specialist general surgeons by 2025	1,724,600	1,724,600	2,586,900	2,586,900				**8,623,000**	**3,846,120**
	3.1.1.3 Train and graduate 200 Orthopaedic surgical specialists by 2025	1,724,600	1,724,600	1,724,600	1,724,600	1,724,600			**8,623,000**	**3,846,120**
	3.1.1.4 Train and graduate 200 obstetric specialists by 2025	1,724,600	1,724,600	1,724,600	1,724,600	1,724,600			**8,623,000**	**3,846,120**
	3.1.1.5 Train and graduate a total of 240 anaesthesiologists by 2025 (see 3.1.1.1)	431,150	431,150	431,150	517,380	646,725			**2,457,555**	**1,096,144**
	3.1.1.6 Train and graduate 80 urologists by 2025	862,300	862,300	862,300	862,300				**3,449,200**	**1,538,448**
	3.1.1.7 Train and graduate 15 plastic surgeons by 2025	1,150,000	1,150,000	1,150,000					**3,450,000**	**1,538,805**
	3.1.1.8 Train and graduate 15 ENT surgeons by 2025	1,150,000	1,150,000	1,150,000					**3,450,000**	**1,538,805**
	3.1.1.9 Train and graduate 15 pediatric surgeons by 2025	1,150,000	1,150,000	1,150,000					**3,450,000**	**1,538,805**
	3.1.1.10 Train and graduate 42 neurosurgeons by 2025	258,690	258,690	258,690	258,690	258,690	258,690	258,690	**1,810,830**	**807,685**
	3.1.1.11 Train and graduate 550 NTA level 7 nurse anaesthetists by 2025	802,500	802,500	802,500	1,605,000	1,605,000	1,605,000	1,605,000	**8,827,500**	**3,937,333**
	3.1.1.12 Train and graduate 550 NTA level 8 nurse anaesthetists by 2025	1,234,000	1,234,000	1,234,000	2,468,000	2,468,000	2,468,000	2,468,000	**13,574,000**	**6,054,416**
	3.1.1.13 Train and graduate 550 NTA level 7 OR/critical care nurses by 2025	802,500	802,500	802,500	1,605,000	1,605,000	1,605,000	1,605,000	**8,827,500**	**3,937,333**
	3.1.1.14 Train and graduate 550 NTA level 8 OR/critical care nurses by 2025	1,234,000	1,234,000	1,234,000	2,468,000	2,468,000	2,468,000	2,468,000	**13,574,000**	**6,054,416**
3.1.2 Increase the intake of SOA residents through the expansion of existing programs and creation of new decentralised training programs	3.1.2.1 Facilitate discussions with TCU for recognition of ECSA training model	115,000	230,000	345,000					**690,000**	**307,761**
	3.1.2.2 Ensure every zone has a designated satellite training center (at the Fully Functional Surgical center/zonal hospital) through the adoption of the ECSA training model to support surgical graduates to practice where they train	227,100	416,800	550,700	323,000	369,000	396,600		**2,283,200**	**1,018,376**
	3.1.2.3 Upgrade training centers (zonal hospitals and fully functional regional surgical centers) to have a requisite number of trainers, workload and quality guidelines	See 1.1.2.2								
3.1.3 Establish a practical training program as part of	3.1.3.1 Incorporate practical training in surgery, anesthesia and obstetrics during internship		48,975						**48,975**	**21,844**

Human Resource		Implementation Timeframe (TZS, 1000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS, 1,000s)**	**Total Cost (USD)**
the compulsory 1 year internship after medical school	3.1.3.2 Allow the option of choosing a designated specialty during internship and provide training	Costed in 3.1.3.1								
	3.1.3.3 Structure centers that concentrate more on SOA training for interns, to attract those going to work in remote areas to build up SOA skill and attract those wanting to go into SOA specialty training		43,770						**43,770**	**19,523**
3.1.4 Ensure basic surgical and anaesthesia core competencies are taught and assessed in the undergraduate medical curriculum	3.1.4.1 Develop a robust curriculum for surgical and anaesthesia competency		69,725						**69,725**	**31,099**
	3.1.4.2 Ensure adoption surgical and anaesthesia competency curriculum into undergraduate curriculum at all medical schools in all areas		44,070						**44,070**	**19,657**
3.1.5 Implement National graduate competency exams	3.1.5.1 Ensure all graduating trainees are deemed competent using the same standards	24,195	24,195	24,195	24,195	24,195	24,195	24,195	**169,365**	**75,542**
3.2.1 Staffing permits to be made available to meet minimum staffing guidelines	3.2.1.1 Review staffing levels for inclusion of surgery and anaesthesia specialists on minimum staffing guidelines from MOHCDGEC down from national to district level	14,690		14,690				14,690	**44,070**	**19,657**
	3.2.1.2 Ensure 100% of upgraded health centers meet minimum staffing recommendations for SOA service delivery		480,000	960,000	1,920,000	2,880,000	3,840,000	4,800,000	**14,880,000**	**6,636,931**
	3.2.1.3 Ensure 100% of district hospitals meet minimum staffing recommendations for SOA service delivery		3,290,280	6,580,560	10,431,240	15,177,600	22,075,920	37,040,220	**94,595,820**	**42,192,605**
	3.2.1.4 Ensure 100% of regional hospitals meet minimum staffing recommendations for SOA service delivery	1,773,360	5,853,120	9,941,040	15,940,800	19,188,000	25,085,280	29,320,200	**107,101,800**	**47,770,651**
	3.2.1.5 Ensure 100% of zonal hospitals meet minimum staffing recommendations for SOA service delivery	529,440	1,714,560	2,975,760	4,266,240	5,472,720	6,614,880	8,644,320	**30,217,920**	**13,478,109**
	3.2.1.6 Regional and District levels to have retention schemes for SOA specialists	61,840	267,360	492,880	775,680	1,072,720	1,434,720	2,202,640	**6,307,840**	**2,813,488**
3.3.1 Ensure deployment of HR as functioning HR clusters-surgeon/anaesthesiologist/obstetrician/Administrative support	3.3.1.1 Ensure minimum staffing guidelines are met from higher level to lower levels of care for specialty care and lower to higher for emergency care	See 3.2.1.2; 3.2.1.3; 3.2.1.4; 3.2.1.5								
	3.3.1.2 Ensure minimum staffing guidelines allow for a pool of specialists at regional level to allow coverage for leave/training at the district hospital to allow uninterrupted service delivery	See 3.2.1.2; 3.2.1.3; 3.2.1.4; 3.2.1.5								
	3.3.1.3 Ensure the minimum staffing levels are deployed as a functioning surgical team for sustainable coverage	See 3.2.1.2; 3.2.1.3; 3.2.1.4; 3.2.1.5								

Human Resource		Implementation Timeframe (TZS, 1000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS, 1,000s)**	**Total Cost (USD)**
3.3.2 Incentivize retention of rural SOA workforce	3.3.2.1 Improve matching of staff with incentives and preferences to increase the likelihood of assigned posts being taken up		29,380	29,380					**58,760**	**26,209**
	3.3.2.2 Sponsor and train providers from remote areas to maximize chance of returning to rural areas	See 3.1.1.1 and 3.2.1.6								
	3.3.2.3 Develop and establish new contracting systems such as bonding systems for those receiving funding	See 3.3.2.2								
	3.3.2.4 Provide non-financial incentives including housing, electricity and internet access	920,000	1,840,000	2,300,000	2,208,000	1,380,000	1,380,000	1,058,000	**11,086,000**	**4,944,692**
3.4.1 Provide in service training programs, to refresh and enhance skills of current providers at the hospital level and above	3.4.1.1 Ensure all hospital level providers receive appropriate in service training adapted to the needs of each hospitals. (Eg: ATLS, Neonatal resuscitation, safe surgery checklist etc)		616,720	616,720	616,720	591,500	572,000	591,500	**3,605,160**	**1,608,011**
	3.4.1.2 Each hospital to have an in-house training plan with an allocated budget	NSOAP regional team								
3.4.2 Provide additional short courses to refresh and enhance skills of current providers at the health center and community level	3.4.2.1 Design curriculum and deliver training to all health center workers and community health workers on: Recognition of surgical conditions, recognition of treatable congenital malformations, treatment of minor burns, the surgical referral pathway--> who to refer, to which hospital, when (see service delivery)	92,940	91,500	91,500	91,500	91,500	91,500	91,500	**641,940**	**286,325**
3.4.3 Develop an outreach program for supportive supervision for SOA and nursing staff	3.4.3.1 Develop and coordinate programs at the zonal level for supportive supervision and mentorship for surgery, anaesthesia and obstetric providers and nurses at regional hospitals	143,520	215,280	215,280	215,280	215,280	215,280	215,280	**1,435,200**	**640,143**
	3.4.3.2 Develop and coordinate programs at the regional level for supportive supervision and mentorship for general surgery, anaesthesia and obstetric providers and nurses at health centers and district hospitals	736,000	736,000	736,000	736,000	736,000	736,000	736,000	**5,152,000**	**2,297,948**
3.5.1 Establish an appropriate task-sharing system	3.5.1.1 Identify existing task sharing practices	See 3.5.1.2								
	3.5.1.2 Develop guidelines for each SOA task-sharing cadre including supervision, outcome reporting and communication pathways	102,035							**102,035**	**45,511**
	3.5.1.3 Monitor and evaluate task sharing programs, and report routine outcome measures	23,000	23,000	23,000	23,000	23,000	23,000	23,000	**161,000**	**71,811**
	3.5.1.4 Convene working group with MOHCDGEC, professional societies to define the scope of work for AMOs, competency curriculum, distribution, utilization and long term planning around AMO employment and regulation	See 3.5.1.2								

Human Resource		Implementation Timeframe (TZS, 1000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS, 1,000s)**	**Total Cost (USD)**
3.5.2 Increase capacity of biomedical equipment technicians	3.5.2.1 Ensure training programs for BMET at each zonal hospital	-								
	3.5.2.2 Establish sufficient positions for BMET within the minimum staffing guidelines	See 3.1.2.4								
Increase the capacity of nurse anaesthetists	3.5.3.1 Standardize NTA level 7 & 8 nurse anaesthesia training curriculum	2,398,690							**2,398,690**	**1,069,888**
	3.5.3.2 Expand nurse anaesthetists training centers to include all zonal centers and fully functional surgical centers	302,100	374,200	446,300	518,400	590,500	662,600	432,600	**3,326,700**	**1,483,809**
	3.5.3.3 Transition all practicing nurse anaesthetists to one year trained NTA then to 3 year NTA staff the health centers	See 3.2.1.2								
	3.5.3.4 Implement a nurse anaesthesia logbook to allow supportive supervision of nurse anaesthetists and review of practice		136,054						**136,054**	**60,684**
	3.5.3.5 Develop supportive supervision networks of nurse anaesthetists to link them to anaesthesia providers at the regional level	See 3.4.3.1 and 3.4.3.2								
3.6.1 Establish a system to link CPD/CME to medical licensing for SOA specialist practitioners	3.6.1.1 Professional associations (for example: TSA, SATA, AGOTA, TOA) to work with Medical Council of Tanganyika to develop guidelines for revalidation in line with the Medical and Dental and Allied Professionals Act of 2017.		89,235						**89,235**	**39,802**
3.6.2 Increase opportunities for CPD/CME for SOA practitioners	3.6.2.1 Acquire access to online tool to log CME activities		81,018	73,600	73,600	73,600	73,600	73,600	**449,018**	**200,275**
	3.6.2.2 Seek external partners for short course training	NSOAP Coordinator time								
	3.6.2.3 Accredit CME for trainers and learners during internal mission activities	NSOAP team time								
3.7.1 NTA level 7 & 8 theatre nurse trained	3.7.1.1 Develop curriculum for NTA level 7 & 8 theatre nurse training	2,398,690							**2,398,690**	**1,069,888**
	3.7.1.2 Implement Theatre nurse training at 4 training institutions		302,100	374,200	446,300	518,400			**1,641,000**	**731,936**
	3.7.1.3 Train 40 theatre nurses per year at each of the 4 training institutions	See 3.1.1.9 & 3.1.1.10)								
3.7.2 Improved communication and team work	3.7.2.1 Provide training on leadership and problem solving to all clinical and non clinical staff involved in SOA care through a train the trainer model	46,157	58,637			58,637		58,637	**222,068**	**99,049**
	3.7.2.2 Develop standards for team communication and team leadership and run necessary training	29,090							**29,090**	**12,975**
	3.7.2.3 Share best practices and exchange around management capacity building	40,430		40,430		28,600		28,600	**138,060**	**61,579**
Total resources needed for human resource		**25,348,207**	**32,445,908**	**43,063,465**	**55,551,415**	**62,112,857**	**72,751,255**	**94,880,662**	**386,153,769**	**172,236,293**

Table 14. Costing of NSOAP Information Management and Technology Activities

Information Management and Technology		Implementation Timeframe (TZS; 1,000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS; 1,000s)**	**Total Cost (USD)**
4.1.1 Develop and implement the monitoring and evaluation framework for collecting indicators around SAO care capacity and quality	4.1.1.1 Convene a group to define monitoring and evaluation framework including -Indicators -Indicator definitions -SOPs for indicator collection and reporting -Targets -Relevant data leverage SOPs	30,145	30,145						**60,290**	**26,891**
	4.1.1.2 Implement the monitoring and evaluation framework at all facilities		1,618,998	357,760	1,240,148	357,760	1,240,148	357,760	**5,172,574**	**2,307,125**
4.1.2 Include the 6 recommended Lancet Surgical Indicators in Monitoring and Evaluation framework	4.1.2.1 Include provisions for collection and national reporting of the 6 Lancet indicators within the monitoring and evaluation framework.	See 4.1.1.1								
4.1.3 Ensure consumable availability is included in the monitoring and evaluation framework	4.1.3.1 Select essential anaesthesia and resuscitation drugs to integrate into the tracer medication on HMIS	see 4.1.1.2								
	4.1.3.2 Select essential surgical consumables to integrate into tracer consumables on HMIS	See 4.1.1.2								
4.1.4 Create new SOA specific registries	4.1.4.1 Set up national trauma registry to track morbidity and mortality	21,600	256,800	256,800	256,800	256,800	256,800	256,800	**1,562,400**	**696,878**
	4.1.4.2 Set up SOA related morbidity and mortality registry (POMR)	21,600	256,800	256,800	256,800	256,800	256,800	256,800	**1,562,400**	**696,878**
4.2.1 Develop and implement data use and dissemination strategy	4.2.1.1 Develop reporting SOPs for ensuring that necessary data is collated and escalated to district, regional and national levels	See 4.1.1.1								
	4.2.1.2 Develop SOPs to ensure relevant data and reports are fed back to all levels down to facility level.	See 4.1.1.1								
	4.2.1.3 Ensure that internationally recommended indicators are published and reported on the appropriate international platforms (WHO, WDI)	See 4.1.1.1								
	4.2.1.4 Consider information to be fed back to the community to promote community engagement and advocacy and how it will be shared	62,170	33,800	33,800	33,800	33,800	33,800	33,800	**264,970**	**118,185**
4.2.2 Mortality and morbidity meetings instituted to review and action relevant data	4.2.2.1 Develop, disseminate and implement guidelines for mortality and morbidity review and response meetings	143,453			120,980			120,980	**385,413**	**171,906**
	4.2.2.2 Develop critical incident SOPs to define critical incidents and ensure they are reported and logged at the time of the event	150,870		120,980			120,980		**392,830**	**175,214**
	4.2.2.3 Each facility at all levels to institute SOA-related mortality and morbidity meetings on a monthly basis. Each M&M meeting should be adequately	20,000		20,000		20,000		20,000	**80,000**	**35,682**

Information Management and Technology		Implementation Timeframe (TZS; 1,000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS; 1,000s)**	**Total Cost (USD)**
	documented and conclude with an action plan to improve quality of service									
	4.2.2.4 Expand the quarterly regional maternal M&M meeting to cover all SAO cases	1,011	1,011	1,011	1,011	1,011	1,011	1,011	**7,079**	**3,157**
4.3.1 Ensure health facilities SOA data can be aggregated and reported digitally	4.3.1.1 Ensure all levels of facility from health center and above have functioning computers and internet connectivity in the OR to log case information (Main connectivity costs to be found in "E-health strategy")	23,525	23,525	23,525	23,525	23,525	19,356	16,800	**153,781**	**68,591**
	4.3.1.2 Support the activities of the "E-health strategy" in strengthening digital information management									
	4.3.1.3 Ensure anaesthesia data is captured in the EMR	3,840							**3,840**	**1,713**
	4.3.1.4 Integrate surgical indicators into existing data collection platforms (e.g HMIS)	3,840							**3,840**	**1,713**
	4.3.1.5 Advocate for inclusion of SOA indicators on the national dashboard	See 4.3.1.4								
4.4.1 Increase the number and quality of research projects designed and implemented by residents and SOA providers	4.4.1.1 Build capacity of SOA providers in research and clinical audit methods		953,740	942,240	942,240	942,240	942,240	942,240	**5,664,940**	**2,526,735**
	4.4.1.2 Inform the SOA research priorities with NIMR	NSOAP Coordinator								
	4.4.1.3 Promote independent research and clinical audit in SOA	See 4.4.1.1								
4.5.1 Implement a telemedicine strategy for SOA	4.5.1.1 Review and strengthen the existing telemedicine capacities to make sure there are being used optimally	See National E-Health Strategy								
	4.5.1.2 Sensitize SOA providers as to the existing available telemedicine services	16,097		16,097			16,097		**48,291**	**21,539**
	4.5.1.3 Generate a rota and guidance for SOA telemedicine coverage for: -Consultation for difficult cases - Referral decisions - Review and audit of cases - Higher to lower level mentorship (* assume require one surgeon, one anaesthesiologist, one obstetrician per region 24/7 on a rota of 6 people per month)	673,920	673,920	673,920	673,920	673,920	673,920	673,920	**4,717,440**	**2,104,121**
	4.5.1.4 Work with E-health strategy team and e-health centers to ensure SOA is considered for adoption of telemedicine	NSOAP Coordinator time								
Total resources needed for information management and Technology		**1,172,071**	**3,848,739**	**2,702,933**	**3,549,224**	**2,565,856**	**3,561,152**	**2,680,111**	**20,080,087**	**8,956,328**

Table 15. Costing of NSOAP Finance Activities

Finance		Implementation Timeframe (TZS; 1,000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS; 1,000s)**	**Costs (USD)**
5.1.1 Assess the current funding that SOA receives	5.1.1.1 Undertake a thorough mapping of current SOA resources including national, regional and local government and partners.	136,500		27,300		27,300		27,300	**218,400**	**97,413**
5.1.2 Advocate for SAO needs throughout Tanzania at the national level	5.1.2.1 Engage Parliamentarian Champions e.g.(Safe motherhood group, Benjamin Mkapa foundation, social services committee)	4,145	4,145	4,145	4,145	4,145	4,145	4,145	**29,015**	**12,942**
	5.1.2.2 Engage influential people and celebrities	1,658	1,658	1,658	1,658	1,658	1,658	1,658	**11,606**	**5,177**
	5.1.2.3 Showcase the complementary role of NSOAP in RMNCH and align with RMNCH priorities	1,658	1,658	1,658	1,658	1,658	1,658	1,658	**11,606**	**5,177**
	5.1.2.4 Showcase role of SOA care as critical to treatment of NCDs and align with priorities in these areas	1,658	1,658	1,658	1,658	1,658	1,658	1,658	**11,606**	**5,177**
5.1.3 Advocate for SAO needs throughout Tanzania from the council level	5.1.3.1Ensure the joint Annual health sector review is sensitized to SOA needs.	1,658	1,658	1,658	1,658	1,658	1,658	1,658	**11,606**	**5,177**
	5.1.3.2 NSOAP representative/Coordinator to advocate for SOA needs at the TWG annual health sector review.	1,658	1,658	1,658	1,658	1,658	1,658	1,658	**11,606**	**5,177**
	5.1.3.3 Speak through joint Annual health sector review and policy review meetings	1,658	1,658	1,658	1,658	1,658	1,658	1,658	**11,606**	**5,177**
	5.1.3.4 Advocate for surgery inclusion in CCHPs	1,658	1,658	1,658	1,658	1,658	1,658	1,658	**11,606**	**5,177**
5.1.4 Advocate for new funding sources for SAO care	5.1.4.1 Advocate for the establishment of a Trauma fund from motor insurance companies	1,658	1,658	1,658	1,658	1,658	1,658	1,658	**11,606**	**5,177**
	5.1.4.2 Advocate for part of road fund for trauma care	1,658	1,658	1,658	1,658	1,298	1,658	1,658	**11,246**	**5,016**
	5.1.4.3 Advocate for NHIF to allow funds to be used for purchase of surgical consumables	1,658	1,658	1,658	1,658	1,658	1,658	1,658	**11,606**	**5,177**
5.1.5 Match costs and reimbursement for surgical care for sustainable scale up	5.1.5.1 Map costs of select SOA procedures across each zone/region		195,490	195,490	195,490		195,490		**781,960**	**348,778**
	5.1.5.2 Advocate for realistic reimbursements of SOA care from health insurance companies		10,800		10,800		10,800		**32,400**	**14,451**
	5.1.5.3 Establish OOP/co-payment where reimbursement of full cost not achieved		350,000						**350,000**	**156,111**
	5.1.5.4 Based on pricing index establish bundled payments for surgical services so patients can estimate full expense prior to receiving elective care		175,000						**175,000**	**78,055**
5.1.6 Develop partnerships with private providers and private enterprises to sponsor SOA programs	5.1.6.1 Identify potential external and private funders	8,290	8,290	8,290	8,290	8,290	8,290	8,290	**58,030**	**25,883**
	5.1.6.2 NSOAP committee and MoF to approach external and private funders to advocate for funding of programs within the NSOAP	4,145	4,145	4,145	4,145	4,145	4,145	4,145	**29,015**	**12,942**
5.2.1 Improve insurance coverage for surgical conditions	5.2.1.1 Work with health insurance companies to ensure inclusion of core surgical procedures coverage with appropriate cost in universal health coverage package	4,145	4,145	4,145	4,145	4,145	4,145	4,145	**29,015**	**12,942**
	5.2.1.2 Advocate to health insurance companies around the cost effectiveness of surgical care and its important role in attaining	8,290	8,290	8,290	8,290	8,290	8,290	8,290	**58,030**	**25,883**

Finance		Implementation Timeframe (TZS; 1,000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS; 1,000s)**	**Costs (USD)**
	universal health coverage to make a case for coverage									
5.2.2 Work with the social services department to sensitize communities about the cost of surgical conditions	5.2.2.1 Develop strategy for community sensitization around the cost of SOA care and availability of insurance coverage	1,800							**1,800**	**803**
6.5.1 Ensure Costs of NSOAP are kept up to date through regular review and recosting	6.5.1.1 Recost NSOAP to reflect implementation progress, past expenditure and true costs			15,915					**15,915**	**7,099**
Total resources needed for Finance		**183,895**	**776,885**	**284,300**	**251,885**	**72,535**	**251,885**	**72,895**	**1,894,280**	**844,906**

Table 16. Costing of NSOAP Governance Activities

Governance		Implementation Timeframe (TZS; 1,000s)								
Outputs	**Activities**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total Cost (TZS; 1,000s)**	**Total Cost (USD)**
6.1.1 All stakeholders made aware of content of NSOAP	6.1.1.1Distribute NSOAP to all hospital levels by MOHCDGEC and PORALG	35,000							**35,000**	**15,611**
	6.1.1.2 Orientate Regional secretariats and local government authorities during national training days by MOHCDGEC and PORALG	52,390			52,390			52,390	**157,170**	**70,103**
	6.1.1.3Publish NSOAP on MOHCDGEC and PORALG website	Webmaster time								
6.2.2 Identify specific NSOAP staff at each level of governance from national to facility level	6.2.2.1Appoint full-time national NSOAP coordinator in MOHCDGEC and PORLAG	277,500	277,500	277,500	277,500	277,500	277,500	277,500	**1,942,500**	**866,414**
	6.2.2.2Form national NSOAP section/ steering committee within MOHCDGEC	37,740	37,740	37,740	37,740	37,740	37,740	37,740	**264,180**	**117,832**
	6.2.2.3 Identify Regional and council NSOAP coordinator in each RHMT, CHMTs	No additional cost required								
	6.2.2.4 Establish a multidisciplinary theatre users committee of surgical care providers at each facility	32,280	32,280	32,280	32,280	32,280	32,280	32,280	**225,960**	**100,785**
6.2.3 Produce NSOAP quarterly and annual reports	6.2.3.1 Integrate NSOAP indicators into national system for quality assurance star rating to be monitored by Quality Assurance team	25,714		25,714		25,714		25,714	**102,856**	**45,877**
	6.2.3.2 NSOAP activities to be reviewed as part of the RMHT and quality assurance program quarterly reviews	No additional cost required								
	6.2.3.3 NSOAP reports to be fed back through the appropriate channels to theatre user committee to drive quality improvement	No additional cost required								
6.3.1 Professional societies to commit to support and implement NSOAP	6.3.1.1 Professional associations to draft statement outlining their role in NSOAP implementation (For example: TSA, SATA, AGOTA, TANNA , TAMA, TOA)	No additional cost required								
	6.3.1.2 Professional organizations to nominate representative to sit on NSOAP national Committee	No additional cost required								
6.4.1 Ensure all surgical partnerships are captured within PORALG's health system strengthening resource center to improve coordination	6.4.1.1 Ensure all NGOs wishing to implement SOA activities complete the standard registration form in Tanzania to be completed and submitted to PORALG resource center.	9,890				9,890		9,890	**29,670**	**13,234**
	6.4.1.2 PORALG resource center to communicate with NSOAP coordinators on a monthly basis to ensure they are aware of all SOA activities	No additional cost required								
Total resources needed for governance		**470,514**	**347,520**	**373,234**	**399,910**	**383,124**	**347,520**	**435,514**	**2,757,336**	**1,229,855**

Chapter 11: Appendices

1. Technical Working Group and NSOAP Review Workshop Members

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2. Basic SOA Service Delivery and Infrastructure

Upgraded Health Center						
Examples of conditions treated	**Anaesthesia and Critical Care**	**Human Resources[1]**	**Infrastructure[2]**	**Ancillary Services[2]**	**Minimum CME Training**	**Supportive Supervision**
DENTAL: • Tooth Extraction • Drainage of Dental Abscess • Treatment of Caries **OB-GYN:** • Normal Delivery (No co-morbidity) • C-section (No co-morbidity) • Vacuum Extraction/forceps • Manual vacuum aspiration and dilatation and curettage • Emergency Hysterectomy for uterine rupture or intractable postpartum haemorrhage • Salpingectomy for ruptured ectopic pregnancy **GENERAL SURGICAL:** • Drainage of superficial abscess • Male Circumcision • Minor Burn care • Wound care • Surgical infections **UROLOGY:** • Relief of urinary obstruction: urethral or suprapubic catheterisation **INJURY:** • Basic Resuscitation • Suture of laceration • Closed fracture reduction and stabilisation • Tube thoracostomy (Chest drain • Irrigation and debridement of open fractures	**CRITICAL CARE:** • ICM Level I • Resuscitate • Protect airway • Stabilization and transfer a critically unwell patient **ANAESTHESIA:** • Spinal • Local • Emergency General Anaesthesia (no comorbidities)	• Medical Officer **X 2** • **Anaesthesia and critical care nurse (Level 7-8) x2** • **Surgical nurse (Level 7-8) x2** • **Nominated OR manager**	**BUILDINGS** • Weatherproof building • **Major Operating theatre** • **Dedicated recovery area** • Minor theatre/Procedure room **UTILITIES** • Continuous electricity supply and **OR specific back up generator** • Continuous piped clean water and **OR specific back up water source** • **Continuous supply of oxygen and back up oxygen concentrator** **EQUIPMENT** • **Functioning Suction** • **Functioning Diathermy** • **Functioning Defibrillator** • **Functioning appropriate anaesthesia machine** • **Functioning light with battery to operate without mains power**	**RADIOLOGY** • X-ray • Ultrasound **LABORATORY** • Hb • **Urea + electrolytes** • Malaria screen • HIV testing • **Blood x-match and storage** • **SSD** • **Autoclave** • **Clinical Waste management**	• ALS • ATLS • Leadership and communication • SAFE obs • SAFE peds • Safe Surgery Checklist usage • Recognition of surgical disease • Referral pathway training	• Supportive supervision by Surgeon, anaesthesiologists, Obstetrician and OR nurse teams from the district hospital including on-site visits and telemedicine phone support • Monthly Mortality and Morbidity meeting attended by all theatre users •

*1 Adapted from the Miminum staffing guidelines. Bold text represents updates to the current levels

* 2 Adapted from the Basic Standards for Health and Social Welfare Services, volume 2, Dispensaries and Health Centers, 2015

Bold text represents updates to the current suggested resources

First level and District Hospitals						
Examples of conditions treated	**Anaesthesia and Critical Care**	**Human Resources[1]**	**Infrastructure[2]**	**Ancillary Services[2]**	**Minimum CME Training**	**Supportive Supervision**
ALL HEALTH CENTER PROCEDURES PLUS: **OBS AND GYN** • Tubal ligation • Vasetomy • Visual inspection **GENERAL SURGICAL** • Repair of perforations e.g peptic ulcer • Appendectomy • Bowel Obstruction • Colostomy • Gallbladder disease • Hernia elective and emergency • Hydrocelectomy **INJURY** • Trauma Laparotomy • Fracture reduction • Placement of external fixator and traction • Escharotomy/fasciotomy • Skin graft • Burr hole • Trauma amputation **To assure quality, these are to be performed only if specified and HR and Infrastructure standard are met	**CRITICAL CARE:** • ICM level II **ANAESTHESIA:** • Elective and Emergency General anaesthesia (ASA I-III) • Regional/ Spinal Anaesthesia • Local Anaesthesia • Pediatric 2yrs and above	• **Specialist General Surgeon X2** • **Specialist Anaesthesiologistx1** • **Obstetrician x2** • Medical Officer x4 • Anesthesia and critical care nurse x3 (**Level 8)** • Surgical Nurse **x4 (Level 8)** • **Nominated OR manager** • BMET x 4	**BUILDINGS** • Weatherproof building • Major Operating theatre • **Dedicated recovery area** • Minor theatre/Procedure room • **BMET workshop** • HDU/ITU **UTILITIES** • Continuous electricity supply and **OR specific back-up generator** • Continuous piped clean water and **OR specific back up water source** • Continuous supply of oxygen and back up oxygen concentrator **EQUIPMENT (Each OR)** • Functioning Suction • Functioning Diathermy • Functioning Defibrillator • Functioning appropriate anaesthesia machine • Functioning light with battery to operate without mains power	**RADIOLOGY** • X-ray • Ultrasound • CT **LABORATORY** • Hb • **Urea + electrolytes** • Malaria screen • HIV testing • **Blood x-match and storage** • **SSD** • **Autoclave** • **Clinical Waste management**	• ALS • ATLS • APLS • Leadership and communication • SAFE-obs • SAFE-peds • Safe Surgery Checklist usage • Recognition of surgical disease Referral pathway training • Clinical skills training	• Supportive supervision by Surgeon, anaesthesiologists, Obstetrician and OR nurse teams from the regional hub including on-site visits and telemedicine phone support • Monthly Mortality and Morbidity meeting attended by all theatre users

*1 Adapted from the Minimum staffing guidelines. Bold text represents updates to the current levels

* 2 Adapted from the Basic Standards for Health and Social Welfare Facilities, Volume 3, Hospitals at Levels I & II, 2015

Bold text represents updates to the current suggested resources.

Regional Hospitals						
Examples of conditions treated	**Anaesthesia and Critical Care**	**Human Resources[1]**	**Infrastructure[2]**	**Ancillary Services[2]**	**Minimum CME Training**	**Supportive Supervision**
ALL HEALTH CENTER and DISTRICT PROCEDURES PLUS: **OB-Gyn** • Full emergency service • Comprehensive elective service including hysterectomy and other pelvic surgery. **UROLOGY** • Full emergency Urology services including ureteric obstruction • Comprehensive elective Urology services including TURP and prostatectomy **ORTHOPAEDIC** • Full emergency orthopaedic services including internal fixation • Comprehensive elective orthopaedic services including joint replacement **ENT** • Comprehensive emergency ENT coverage • Elective ENT clinic	**CRITICAL CARE:** • ICM level III and IV **ANAESTHESIA:** • Local • Regional/Spinal • Emergency and Elective General (all ASA- no difficult airway) • Paediatric <2yrs	• Specialist General Surgeon x 4 • Specialist Orthopaedic **x 4** • Specialist ObGyn x4 • Specialist ENT **x 2** • **Specialist Urology x2** • Anesthesiologist **x4** • nurse **(level 7)x 12** • **Nominated OR manager** • Nurse Anaesthetist (level 7/8**) x 7** • Radiologist -1 • Medical Officers- 16 • Biomedical Engineer--3 • Biomedical Technician-4 • Ortho technician- 1 • Physiotherapist **x3** • Assist. Physiotherapist **x4** • Occupational ther.-1 • **Social worker**	**BUILDINGS** • Weatherproof building • Major Operating theatre x 3 • **Dedicated recovery area** • Minor theatre/Procedure room • **BMET workshop** • HDU/ITU • PICU and NICU **UTILITIES** • Continuous electricity supply and **OR specific back up generator** • Continuous piped clean water and **OR specific back up water source** • Continuous supply of oxygen and back up oxygen concentrator **EQUIPMENT (Each OR)** • Functioning Suction • Functioning Diathermy • Functioning Defibrillator • Functioning appropriate anaesthesia machines • Functioning light with battery to operate without mains power • Full continuous patient monitoring in OR, Recovery, ITU/HDU • Long term ventilation capacity • Haemofiltration	**RADIOLOGY** • X-ray • Ultrasound • CT **LABORATORY** • Hb • **Urea + electrolytes** • Malaria screen • HIV testing • **Blood bank** • **SSD** • **Autoclave** • **Clinical Waste management**	• ALS • ATLS • APLS • Leadership and communication • SAFEobs • SAFEpeds • Safe Surgery Checklist usage • Recognition of surgical disease Referral pathway training • Clinical skills training.	• Supportive supervision by Surgeon, anaesthesiologists, Obstetrician and OR nurse teams from the zonal hub including on-site visits and telemedicine phone support • Monthly Mortality and Morbidity meeting attended by all theatre users

*1 Adapted from the Miminum staffing guidelines. Bold text represents updates to the current levels

* 2 Adapted from the Basic Standards for Health and Social Welfare Facilities, Volume 3, Hospitals at Levels I & II, 2015

Bold text represents updates to the current suggested resourc

3. List of Figures

4. List of Tables