

ENHANCING RURAL HEALTHCARE

# Surgery In Nepal's Remote Districts





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# Definition of Terms

<b>AA</b>	Anesthesia Assistant
<b>ASBA</b>	Advanced Skilled Birth Attendant
<b>CEONC</b>	Comprehensive Emergency Obstetric and Newborn Care
<b>CS</b>	Caesarean Section
<b>DCP 3</b>	Disease Control Priorities 3
<b>DHS</b>	District Hospital Support
<b>DoHS</b>	Department of Health Services
<b>GA</b>	General Anaesthesia
<b>gSAO</b>	Generalist Surgeon, Anaesthesia provider, ASBA
<b>GoN</b>	Government of Nepal
<b>HDI</b>	Human Development Index
<b>HMIS</b>	Health Management Information System
<b>HRS</b>	Human Resources for Surgery
<b>KAHS</b>	Karnali Academy of Health Sciences
<b>KII</b>	Key Informant Interview
<b>LCoGS</b>	Lancet Commission on Global Surgery
<b>MDGP</b>	Medical Doctor in General Practice
<b>MoH</b>	Ministry of Health
<b>MO</b>	Medical Officer
<b>MO – ASBA</b>	Medical Officer with Advanced SBA training
<b>MSS</b>	Minimum Service Standards
<b>NDHS</b>	Nepal Demographic Health Survey
<b>NFHS</b>	Nepal Health Facility Survey
<b>NHTC</b>	National Health Training Center
<b>NSI</b>	Nick Simons Institute
<b>OT</b>	Operation Theatre
<b>SAO</b>	Surgeon, Anaesthesiologist and Obstetrician
<b>SBA</b>	Skill Birth Attendant
<b>WHO</b>	World Health Organization
<b>WHO – SAT</b>	WHO Situational Analysis Tool

# Contents

Definition of Terms .....	2
Executive summary .....	4
Background .....	6
Study Objectives .....	7
Methods .....	8
Findings .....	10
Operations performed .....	10
Bellwether Procedures .....	12
Access .....	16
Human Resources for surgery (HRS) .....	17
Enabling environment for surgery .....	19
The Complete OT in a district .....	20
Surgically functional hospitals and their characteristics .....	21
Conclusions and Recommendations .....	24
References .....	25

# Executive Summary



## Background

Nepal's current state of surgical provision and activity is unclear. New international commissions like LCoGS and DCP 3 have highlighted the huge unmet need for surgery. Beyond Caesarean section (CS), there is still little attention given to surgery in Nepal, especially in Nepal's remote districts: the hardest to reach, the most medically underserved, and the highest national challenge.

## Study Objectives

To determine the surgical volumes and readiness in Nepal's remote districts, compare these with LCoGS indicators, analyse characteristics of a functional district surgical team and thus propose a pathway to upscale surgery across Nepal's remote districts as part of a national surgical plan.

## Methods

Using a mixed method approach, 39 hospitals in 25 remote districts were visited in 2015-2016. Operations over one year, surgical facility, and interviews from key informants were recorded using a surgical data tool specifically for use in Nepal's district hospitals.

The quantitative variables studied were surgical volume (major operations/100,000 and total operations/100,000 population), Access (availability of CS, Laparotomy, operative orthopaedics in district-the Bellwether procedures ), Human resources for Surgery (density of specialists SAO and generalist SAO), and Facility for surgery (proportion of essential components available); qualitative variables were characteristics of functional hospitals.

## Findings

**Surgical volume:** The median Caesarean sections was 22 per district. Only 21 out of 25 districts had hospitals performing CS. Of these, only 5 districts were at 50% of met need. Laparotomies were performed but numbers were very low. Management of open fractures was not specially recorded but complex orthopaedics was recorded where an orthopaedic surgeon was present or a camp was conducted. Major Surgery rates fall well below with Lancet commission target of 5000/100,000.

Mid-level operations (appendicectomy, abdominal hysterectomy and hernia repair) which can act as “stepping stones” to a higher operative

level were performed in small numbers.

**Access:** For the whole study population, 97% had access to CS, 22% to GI laparotomy, and 34.8% to operative orthopaedics in the district.

### Human resources for Surgery:

The specialist surgeon/ anaesthesiology/ obstetrician (SAO) density is very low at 0.4/ 100,000 against the Lancet target of 20/100,000. However, MDGP led team density (generalist SAO), whilst low, is still 8x higher at 3.1 per/100000; the presence of an MDGP was associated with CS availability.

**Facility for surgery:** Fewer than 50% of hospitals fulfilled

even 80% of essential components required. 72% of hospitals had no functioning GA machine. 25% of hospitals had no transfusion service of any sort.

**Characteristics of functional hospitals** were team work, supportive management, humble lead general doctor (MDGP), presence of non- doctor anaesthesia provider, a team with higher expectations, and co-operation with the study.

**Characteristics of non-operative hospitals** were a lack of management support, lack of surgical team, dirty unused hospital premises, inadequate human resources, no GA facility, and unsupportive patient parties.

## Conclusions

Surgical unmet needs in remote districts remain a major public health issue. Surgery can and is being done in remote districts but there are surgically "empty" districts. Overall, major operations are low but CS rates are better than the national mean in some districts. Complex high-risk surgery such as laparotomy can be done but

numbers are very low. There is very little operative orthopaedics at district hospitals outside of camps. Generalist SAO doctors (e.g. MDGP) and task sharing health workers are beginning to successfully fill the HRS gap as specialist SAO numbers are very low. The enabling environment for surgery was not adequate in many hospitals. Successful

hospitals have motivated humble teams with good managerial and community support are often MDGP- led and on a pathway to being Bellwether-capable by doing stepping stone operations. LCoGS indicators can be applied in Nepal but are not currently used nor are specific enough for Nepal's remote districts.

## Recommendations

- Skilled human resources and the enabling environment for surgery must be improved to meet surgical need.
- Monitoring progression to adequate surgical coverage must be embedded in HMIS and national reporting with prospective data collection based on adapted surgical data-tools and LCoGS international indicators.
- CEONC based on an MDGP-led generalist surgical team represents a current model of success which should be up-scaled and re-termed CESC (Comprehensive Emergency Surgical Care) to encompass all essential district surgery until there are enough specialist surgical teams.
- This generalist team should be supported to perform other surgeries, including stepping stone procedures to move from CS- capable to a laparotomy and orthopaedic-capable team (full Bellwether access).
- A National Surgical Plan should be made for Nepal building on these recommendations.

# Background

Universal coverage of essential surgery is an essential part of universal health coverage and requires service provision, quality, and access.

In 2015, The Lancet Commission on Global Surgery (LCoGS) and Disease Control Priorities: Essential Surgery (DCP3) were published. These outline (a) the huge unmet global burden of surgical disease, (b) the great health, social and economic consequences, (c) that

Nepal's current state of surgical provision and activity is unclear: beyond CS as part of Comprehensive Emergency Obstetric and Newborn Care (CEONC) services, there has been little attention given to surgery. Demand and demographic studies are beginning to document the expected high surgical burden in Nepal. Documentation of actual surgery performed is limited to the Department of Health Services

to surgery, human resources for surgery), delivery (surgical volume, perioperative mortality), and impact (reduction in impoverishing and catastrophic expenditures). These targets seem applicable to Nepal's healthcare system; however, it is unknown how closely the current surgical volumes, specialist provisions, and surgical locations can relate to these standards.

Nepal's remote districts are some of the hardest to reach and most

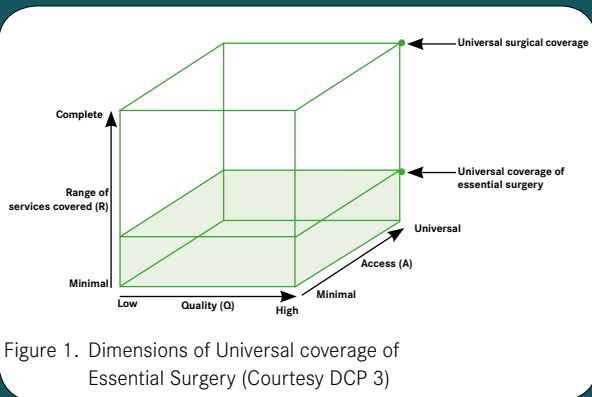


Figure 1. Dimensions of Universal coverage of Essential Surgery (Courtesy DCP 3)



Figure 2. Lancet Commission on Global Surgery Indicators (Courtesy: Lancet Commission on Global Surgery)

surgical procedures provide the most cost-effective of all health interventions, (d) that most of the global population lacks access to this essential service and (e) that surgical scale-up needs to match maternal services provision in need, concept and scope. They provide indicators, targets and pathways to guide analysis and planning for national surgical services. These new initiatives led to the 68th World Health Assembly resolution 2015 (68.15) for all member states to strengthen emergency and essential surgical care and anaesthesia as part of universal health coverage.

(DoHS) Annual Report which reports only CS, total major and minor operations at Government hospitals, and the Nepal Health Facility Survey (NHFS) which reports only CS. There is no further in-depth analysis and no recommendations made for any surgery beyond CS.

Further analysis of the state of surgery is hampered by inconsistent metrics and poor local documentation. There has been very limited 'on the ground' research and currently there is no comprehensive surgical data tool in use. The LCoGS targets consist of six indicators covering preparedness (access

medically underserved in the world. Provision of safe surgery to those populations remains the highest challenge nationally. Therefore, those populations most excluded from surgical access in the 'surgically remote' districts were the focus of the study.

A detailed analysis of the current surgery in the surgically remote districts against local and international standards is required to allow a deeper understanding and widening of Nepali models of affordable effective safe surgical care as a step towards a National Surgical Plan.





# Study Objectives

1. Map surgical volume and current surgical readiness at hospitals in 25 remote districts of Nepal.
2. Thus, create a baseline comparison of current surgical activity in Nepal's remote districts against international recommendations.
3. Develop and pilot a practical globally aligned data-tool of surgical metrics for district hospitals in Nepal.
4. Analyse the characteristics of a functional surgical team and step changes to such district surgical success.
5. Propose a pathway to upscale surgery across Nepal's remote districts within a National Surgical Plan.

# Methods

- First systematic, site-based ‘on-the-ground’ study
- Study data-tool developed from national and international sources
- Data-tool used in 39 hospitals in 25 surgically remote districts
- OT log book used as data source for operations performed, including Bellwether procedures
- Key informant interviews were used for qualitative analysis

This is the first systematic, site-based “on-the-ground” study to map current surgical activity, both surgical volume and readiness across Nepal’s remote districts<sup>1</sup>.

The study data-tool was developed from national and international sources, and refined through piloting. It was then successfully used at 39 hospitals by two medical officer researchers between July–October 2016 (Shrawan– Asar 2072/73) in 25 districts.

This study focused on 25 “surgically remote” districts defined as those with an expected low level of surgery, where the entire district population lives more than two hours from a surgical hospital in another district and into which few patients seldom come for surgery, thus ensuring stable population denominators.

The theatre log book (OT logbook) was used as the absolute data source for operations performed<sup>2</sup>; all essential operations for the fiscal year July 2015–July 2016 (Shrawan– Asar 2072/73) were recorded and included the three Bellwether procedures. The Bellwether procedures are essential operations are deemed indicative of a functional surgical service at district level (LCoGS): CS, laparotomy and management of open fracture. All the operations were subsequently categorised into major and minor operations.

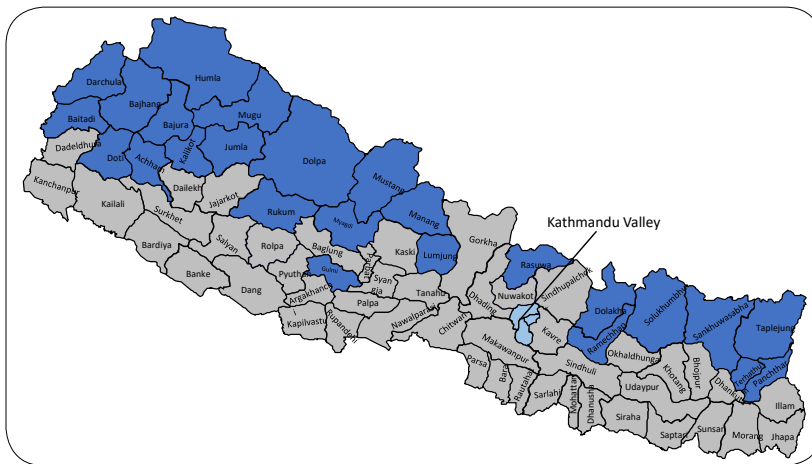


Figure 3 Study Districts (In Dark Blue; Kathmandu Valley in Light Blue)

**Bellwether procedure**  
 “An essential operation deemed indicative of a functional surgical service at district level” (LCoGS)

<sup>1</sup>The study was approved by the Nepal Health Research Council (No. 90/2016); the Nick Simons Institute funded all study costs

<sup>2</sup> All quantitative findings were compared to Lancet Commission of Global Surgery 2030 targets

## Analysis

- **Access to essential operations** was calculated as the percentage of overall total study population with the Bellwether procedures recorded in districts.
- **Surgical readiness (enabling environment)** was assessed by recording
  - Human Resources for surgery (HRS) and
  - facility capacity against a detailed checklist<sup>3</sup> for surgery including OT equipment, anaesthesia equipment and drugs, surgical instruments and support services
- **Hospital surgical mortality** and referral data were recorded if available.
- **Additional calculated indicators** were (a) met need

for CS (based on a predicted WHO minimum rate of 5% of live births) and (b) the ratio of CS/ major operations- a useful indicator of an adequate or improving essential surgical service.

**Qualitative data was analysed using thematic analysis of key informant Interviews (KII) and the researchers own impressions.**



## Characteristics of study Districts and Hospitals

The total population for all of the study districts was 3,605,796 (14% of Nepal's population), with a median district population of 141,652 (range 6399-269,573). 17/25 districts were below the HDI national mean 0.49.

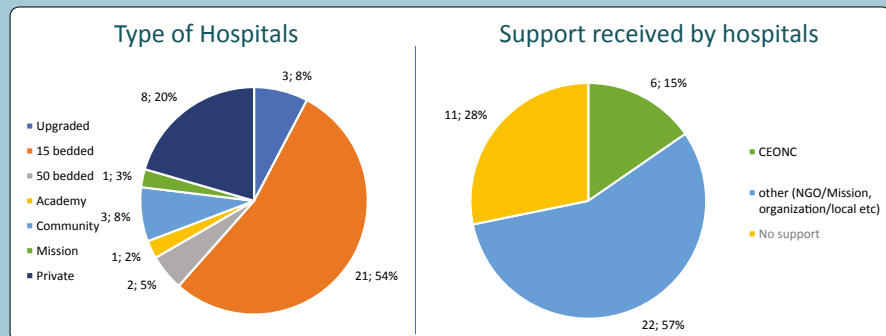


Figure 4 Study Hospitals: Type and Support Received (pie chart labels show numbers and percentages separated by a semi-colon)

<sup>3</sup>Items on the checklist were recorded by the researchers as present and functional or absent according to report by the OT nurse or doctor

# Findings

## Operations Performed

37 hospitals (95%) recorded surgery being performed. Most surgery was minor and most hospitals performed very few operations. In a few hospitals, operations were not recorded throughout the whole year due to the absence of a surgeon.

There were four districts where the most important major operation – Caesarean Section (CS) - was not performed at all.

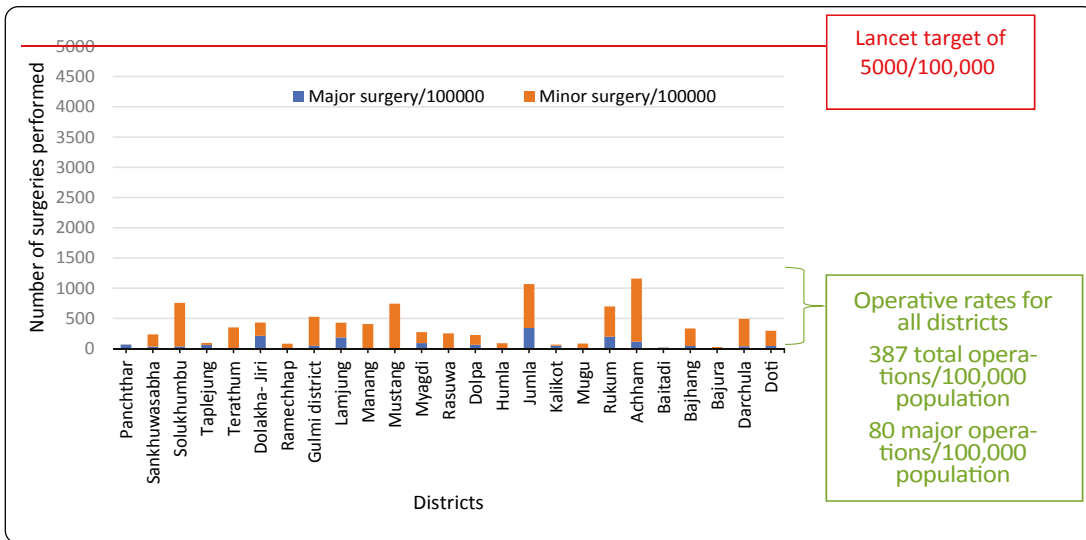


Figure 5 Major and Minor Surgeries Per 100000 Population

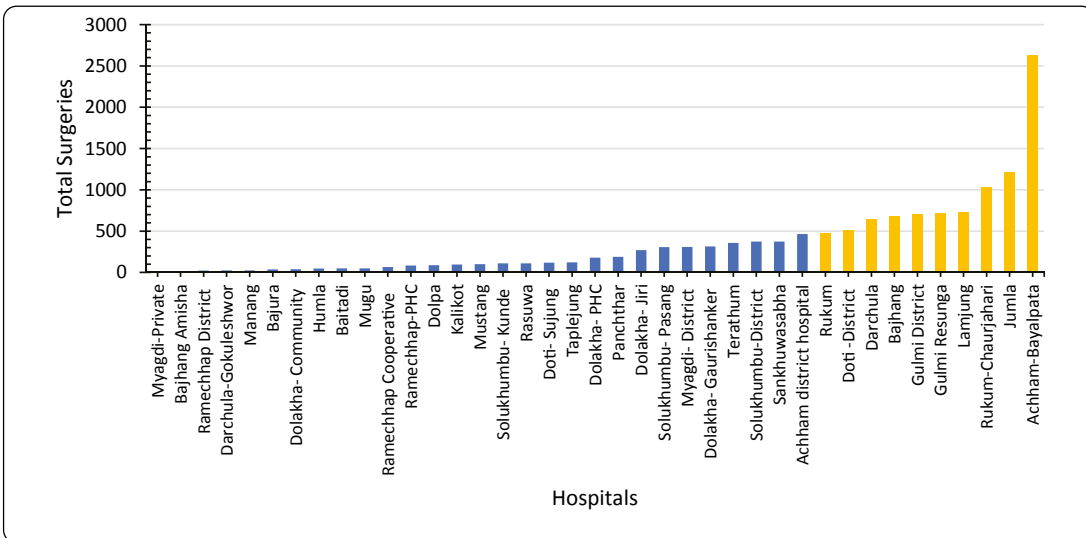


Figure 6 Total Operations Performed by Different Hospitals in 2015-16

**Table 1 Top Ten Procedures Performed**

Procedure	Anaesthesia Provided	No of Cases
1. Closed treatment of fracture (POP/MUA)	No/any	5359
2. Dilation and curettage /MVA(Ob/Gyn)		1700
3. Caesarean Section		1353
4. Incision and drainage of abscess	No/LA only	772
5. Suturing –gynae (episiotomy, cervical and vagina lacerations)	Any	660
6. Incision and drainage of abscess	Ketamine/spinal/GA	578
7. Open treatment of fracture (ORIF)		535
8. Suturing (for wounds)	Any	521
9. Gastroscopy		317
10. Appendicectomy	any	248

Study data was compared with 2015/2016 HMIS data: CS and major operation numbers were similar, except for differences in major operations in two districts Sankhuwasabha and Myagdi.



Some major operations (e.g. Hysterectomy) were performed only by visiting surgical teams (“camps”) – the OT logbook could not discriminate these. 36% of hospitals received gynaecology and 33% orthopaedic camps.

# Bellwether Procedures

## Caesarean Section

Of the Bellwether procedures, CS is most commonly performed (1353) accounting for 5 % of all operations and performed in 69% of hospitals

- Laparotomy was performed in 33% of hospitals but in very low numbers
- No management of open fracture was specifically recorded

CS service is available in 21/25 districts (84%); 27/39 hospitals are doing CS (69% of hospitals). Some districts having more than one hospital performing CS (e.g. Dolakha) but four districts have no CS performed: Manang, Mugu, Mustang, Rasuwa. Total CS for all districts (n=1353): the median annual rate is 22 with a wide range and outliers.

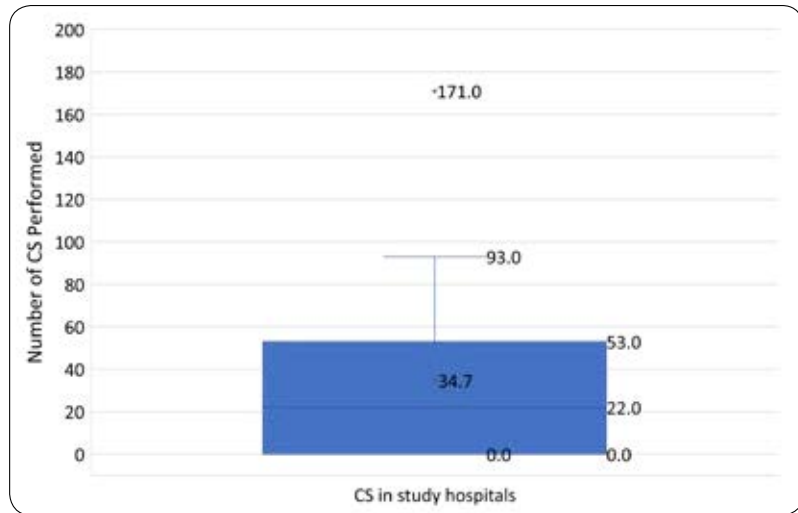


Figure 7 CS Distribution In District Hospitals

## Met Need of CS by District

The met need for CS for each district was calculated as CS numbers performed in the study district divided by predicted WHO minimum CS number at 5% of live births in that district.

Only 5 districts were at 50% of met need; 3 of these were over 75% of met need.

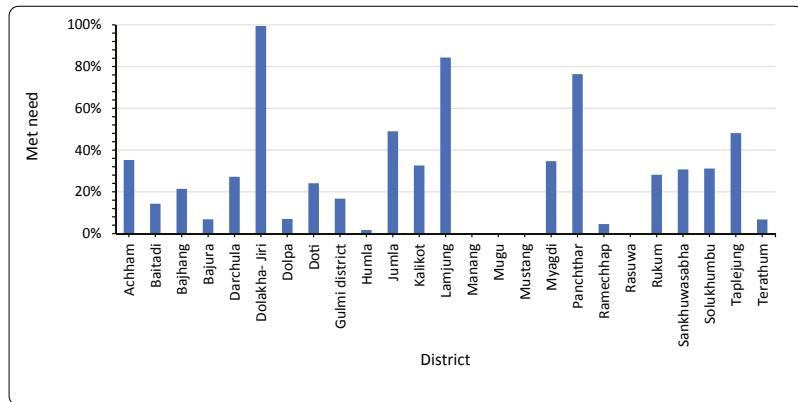


Figure 8 Met Needs of CS Per District

# Hospitals Performing CS or no CS

Some GON district hospitals are providing many CS

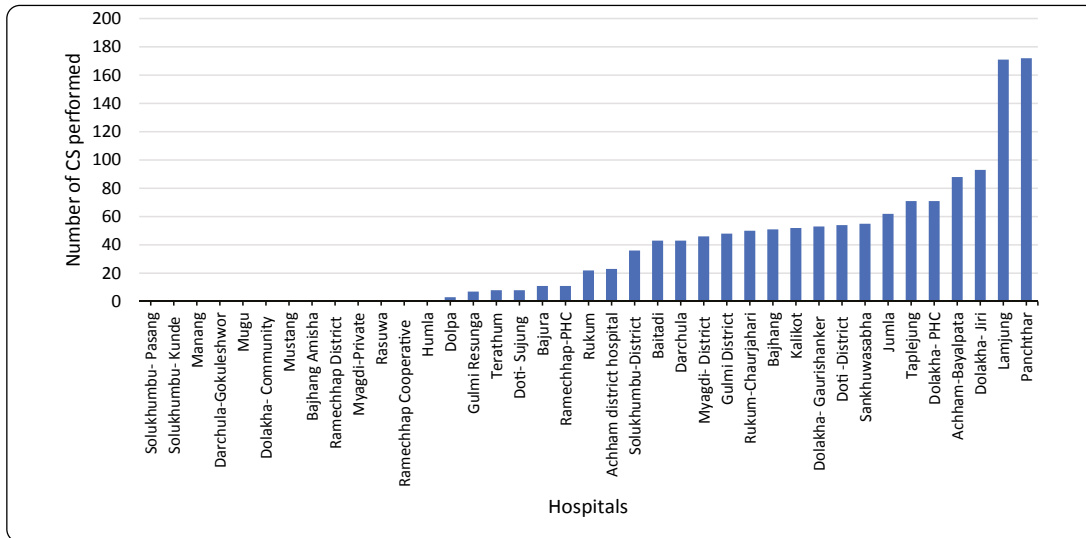


Figure 9 CS conducted in study hospitals

# CS to Major Operations

For all hospitals, the CS/Major surgeries were high at 0.43 (range 0-1); the lower the ratio, the more a hospital may be performing at a higher surgical level. Non-GoN hospitals consistently showed lower ratios than GoN hospitals, indicating greater non-CS major surgical activity in these places or differing focus of that hospital.

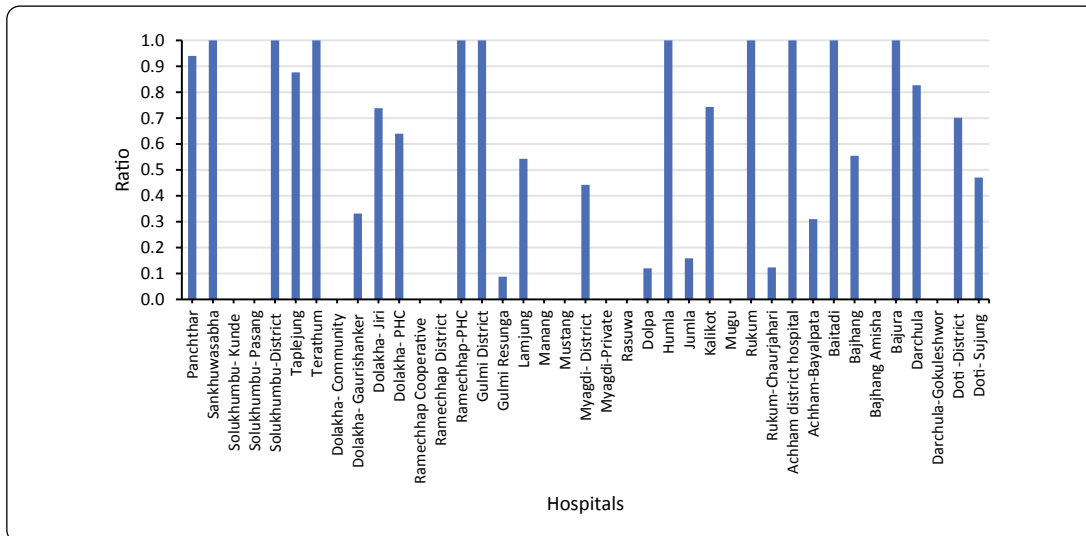


Figure 10 Ratio of CS to Major Operations

# Laparotomy

A gastrointestinal (GI) laparotomy is a complex operation due to the difficult decision to operate, skills required and post-operative care needed- it is usually a step-up from CS for an MDGP led team.

Total numbers of laparotomies were very low across all districts at 60 in total with gastro-intestinal (GI) laparotomies (the usual definition

of laparotomy) in extremely low numbers at 13.

In only 5 districts, there was one or more GI laparotomy performed: Dolakha, Jumla, Kalikot, Rukum, Bajhang; 20 districts had no GI laparotomies performed at all.

However, in three of these districts, GI laparotomy had been successfully performed by a non- specialist

surgeon, supported by a non- doctor anaesthesia provider (AA) in a GoN district hospital (Dolakha, Kalikot and Bajhang).

This is a rate of 0.4/100,000 all districts population. As the surgical burden of disease requiring laparotomy is not known, met need cannot be calculated.

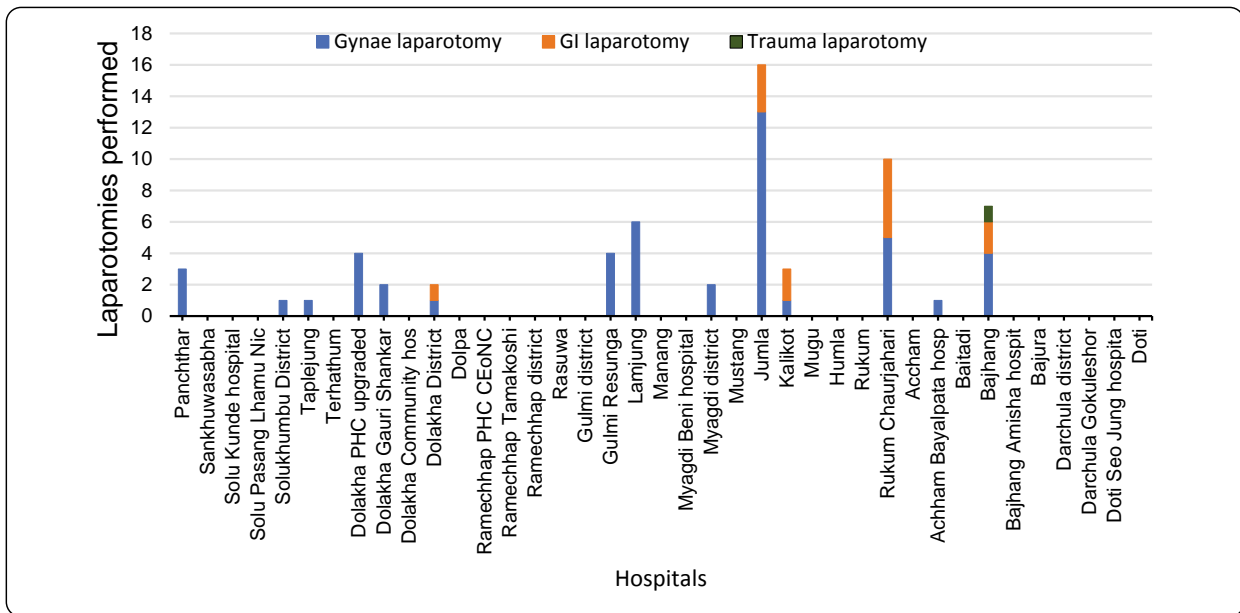


Figure 11 Numbers and Types of Laparotomy at Study Hospitals





# Management of Open Fracture

There was no documentation of procedures for the specific Bellwether indicator of open fracture (simple washout, debridement, external or internal fixation). Major operative orthopaedics took place either in camps by visiting surgeons or at the two hospitals that had orthopaedic surgeons present (not

GoN district hospitals).

However, volumes were significant with open reduction or application of external fixator/traction recorded as the fifth most common operation. These operative skills are more advanced and would represent a step-up for a district hospital surgical service: these could be

used as a proxy measure for the Bellwether indicator of management of open fracture.

Nevertheless, simple closed fracture reduction and wound washouts were widely performed across many hospitals-this begins to meet a basic trauma burden in remote districts.

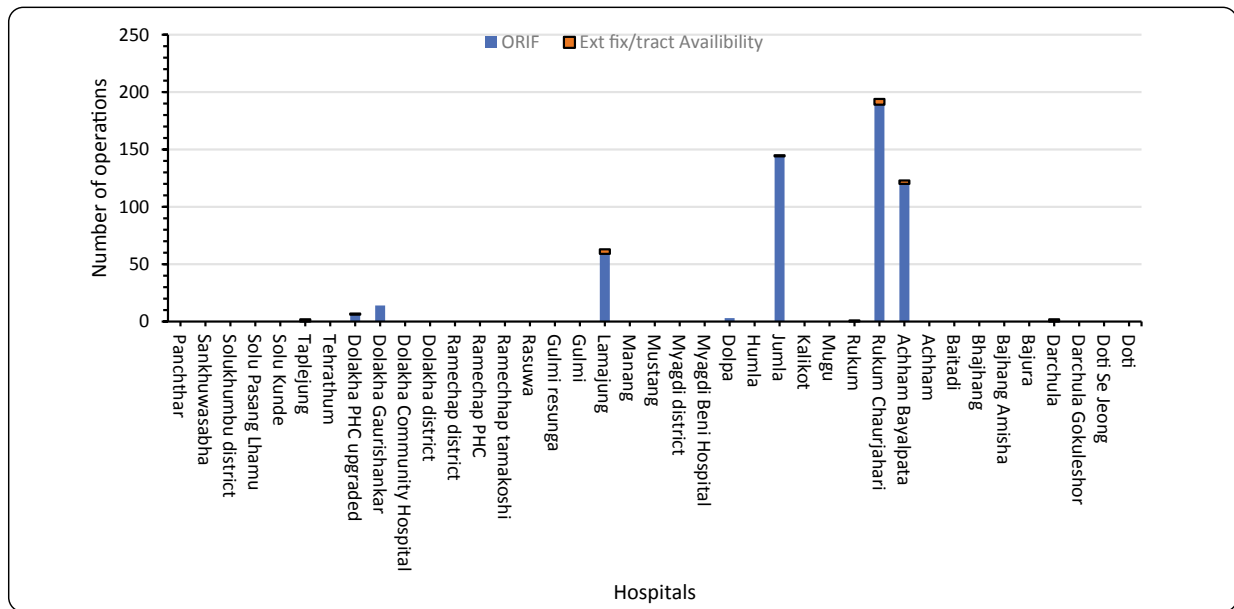


Figure 12 Operative Orthopaedic Operations at Study Hospitals

## Peri-Operative Mortality

**“All hospitals record the percentage of patients operated on who die before discharge from any cause”**

12 hospitals recorded OT peri-operative mortality – absolute numbers were very low and most of these were newborn deaths, recorded at the time of surgery. Other outcomes were not recorded

on the OT record. This may reflect low numbers of operations hence low mortality rates, excellent outcomes or lack of recording. The recommended LCoGS method was not available.



# Findings

## Access

A key LCoGS target is that 100% of the population are within 2 hours of a facility able to perform the Bellwether procedures.

Access to these essential operations was calculated as the percentage of overall total study population with the Bellwether procedures recorded in districts.

CS	97% of total study population
GI laparotomy	22 %
Major Operative Orthopaedics	34.8%

This seems good especially for CS and perhaps these districts are not as surgically remote as they seem. **However, for laparotomy and operative orthopaedic procedures in the districts, these procedures were either rarely performed or inconsistently available.**

Moreover, a 2-hour travel time to surgical assistance for all people in any district cannot be assumed; we cannot report population locality, demographics or travel times.



# Human Resources for Surgery (HRS)

Human resources are reported as specialist surgical, anaesthesiology and obstetric doctors (SAO) and generalist hospital doctors (MDGP) and other health workers providing essential surgery and anaesthetic cover (gSAO). Numbers are reported and compared with the Lancet Commission target of over 20 SAO/100,000 population, this being the level above which maternal mortality dramatically decreases.

## Specialist Surgeons

Overall, specialist surgeons (general, orthopaedics, and obstetricians) and anaesthesiologists were very scarce.

In our study, there were 13 SAO over the entire 25 districts; only 7 districts have SAO and 7 SAO are in

one medical college (KAHS) alone. Specialists SAO density was thus very low at 0.4 per 100,000 for the whole study population (all 25 districts).

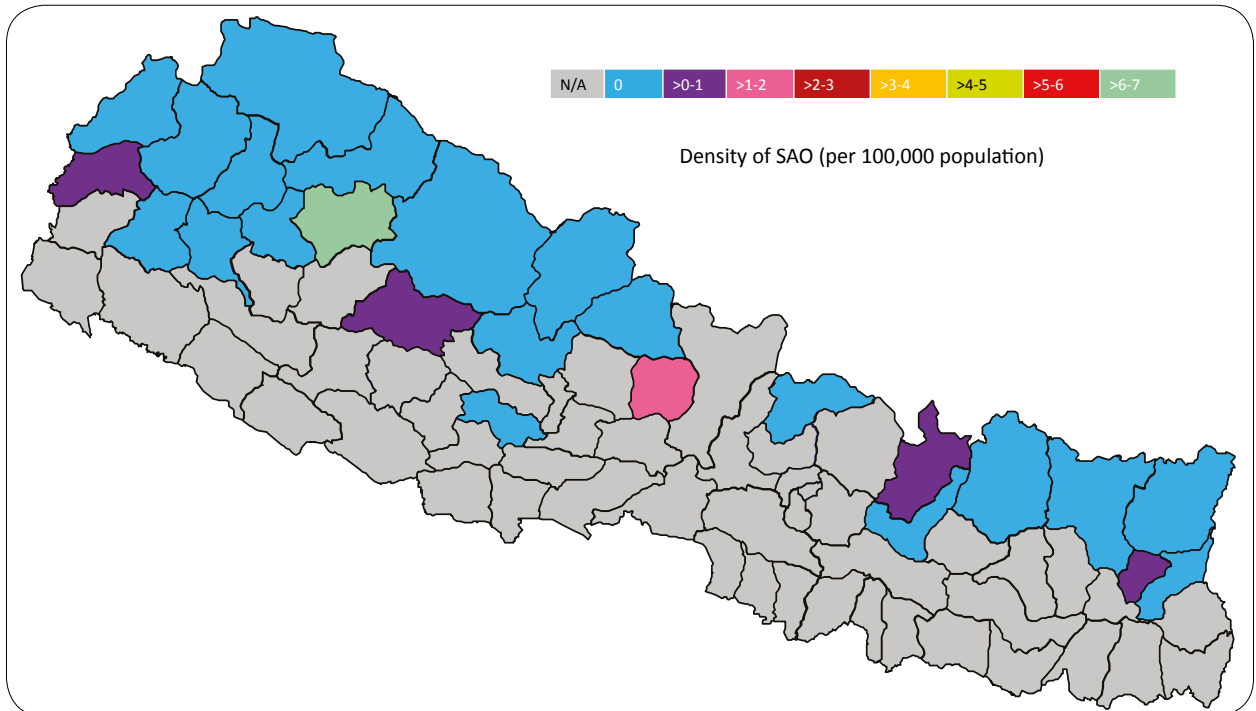


Figure 13 SAO Density Per 100,000 Population in Study Districts

## Generalist Surgical Teams

In these remote districts, the post-graduate doctor with surgical capability most usually present is an MDGP- the medical generalist doctor. Their surgical skills primarily relate to emergency obstetric provision (CS) with some additionally capable of performing laparotomy, operative orthopaedic and other surgeries (appendicectomy).

There were 22 MDGPs in 18 hospitals in 15 districts.

Re-calculating cover against the HRS LCoGS target by adding MDGP

to SAO (termed MDGP+ SAO for this analysis) gives post-graduate surgical cover 2.5 times higher at 1/100,000 – a better reflection of essential surgical skill available if the surgeon only is added.

Furthermore, such MDGPs often work in a generalist surgical team (gSAO). For CS, they are assisted by medical officers (MO) with advanced SBA level (ASBA) training. For anaesthesia, they are assisted by posted to provide CS, anaesthesia assistants AA (46% hospitals), MO (26% hospitals), or another MDGP.

Across the study districts, all members of these generalist surgical teams together number 108 and they are much more widely spread.

This makes gSAO density 8 times higher than SAO at 3.1 per 100,000.

This becomes a better measure of actual and required surgical cover for Nepal’s remote districts.

**In this study, the presence of an MDGP is significantly associated with CS availability.**

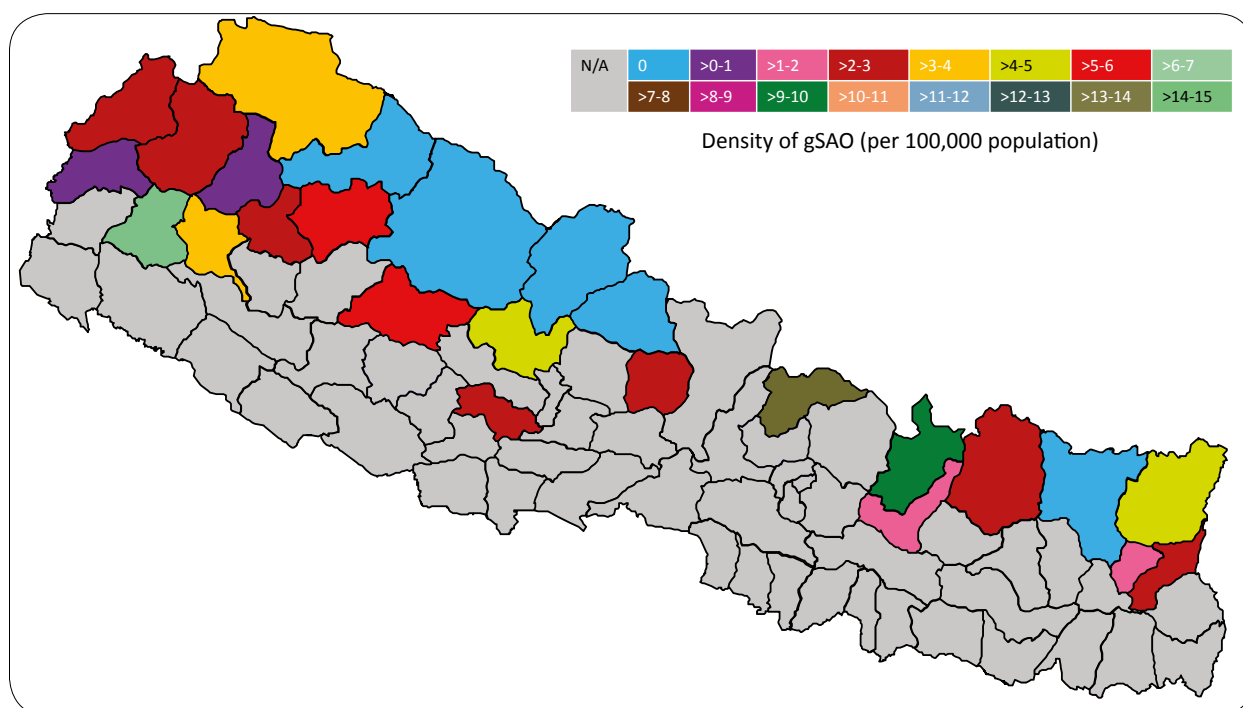


Figure 14 gSAO Density Per 100,000 Population in Study Districts

Table 2 Density of Human Resources for Surgery in Study Districts<sup>4</sup>

Human Resources For Surgery	Density (Per 100,000)	<b>Thus, for Nepal’s remote districts, a more complete analysis of all available surgical teams (gSAO and SAO) reveals a combined density of 3.5/100,000 against the LCoGS target of 20 SAO/100,000 population.</b>
SAO	0.4	
SAO+ MDGP	1	
gSAO team (MDGP, ASBA MO, AA)	3.1	
SAO + gSAO team	3.5	

<sup>4</sup>The study attempted to record continuous presence of key HRS over the previous year but this data was not objectively recorded and cannot be reported.

# Enabling Environment for Surgery

The enabling environment for surgery was incomplete in most hospitals with fewer than half of all hospitals having even 80% of all these essential components.

Specifically, 72% of hospitals had no functioning GA machine; in fact, only 4/39 hospitals could perform GA at all (both machine and halothane available).

25% of hospitals had no transfusion service of any sort, neither blood bank nor a volunteer pool, to call upon when needed ('walking blood bank') and half of all hospitals had

no 24-hour blood service.

X-ray and Ultrasound was available 24h in the majority of hospitals -89% and 76% respectively.

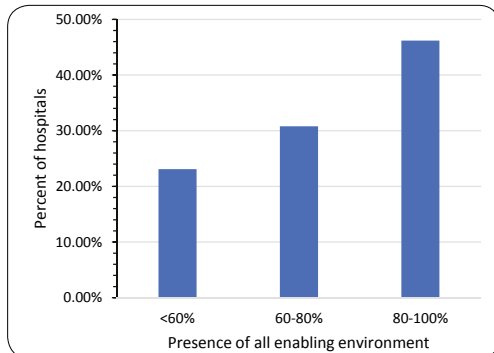


Figure 15 % Availability on Enabling Environment Checklist

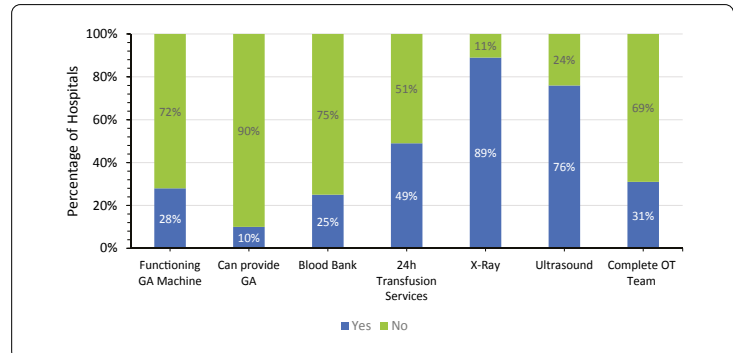


Figure 16 Enabling Environment Factors and Complete Ot Team



# The Complete OT in a District

For analysis, the minimum for essential surgery (the complete OT) is defined as

Criteria	Remarks
<ul style="list-style-type: none"> <li>• Minimal Human Resources for surgery (HRS)                             <ul style="list-style-type: none"> <li>▶ the presence of necessary surgeon (MDGP or specialist)</li> <li>▶ Anaesthesia provider (AA/ other anaesthetist)</li> <li>▶ OT nurse</li> </ul> </li> </ul>	Only 39% of hospitals have nurses with specific OT training and often this would only be one person.
<ul style="list-style-type: none"> <li>• Hospital having &gt; 80% of the checklist</li> </ul>	<b>15 hospitals had adequate HRS, 18 had &gt; 80% of the checklists but only 12 hospitals (31%) had both</b>

**There is a significant association between a complete OT and availability of all three Bellwether operations<sup>5</sup>.**



### LCoGS applicability to Nepal

- Key LCoGS targets seem applicable in Nepal with suggested adaptations:
  - ▶ the 2h access target requires disaggregated population demographics
  - ▶ the type of number of operations per 100000 needs clarification
  - ▶ case definitions of laparotomy and open fracture management need to be defined
  - ▶ for Nepal, gSAO provision needs to be an additional metric to SAO to assess HRS

<sup>5</sup>There are yet no indicators for a complete surgical team to compare against.

# Surgically Functional Hospitals and Their Characteristics

## Functionality: By Bellwether Procedures

Using the Bellwether procedures as a key indicator, 13 hospitals were performing CS and laparotomies; by this definition, these were at the highest level of functionality for these remote districts (when orthopaedic surgery is excluded from this analysis). An additional 14 were performing CS only but no laparotomy.

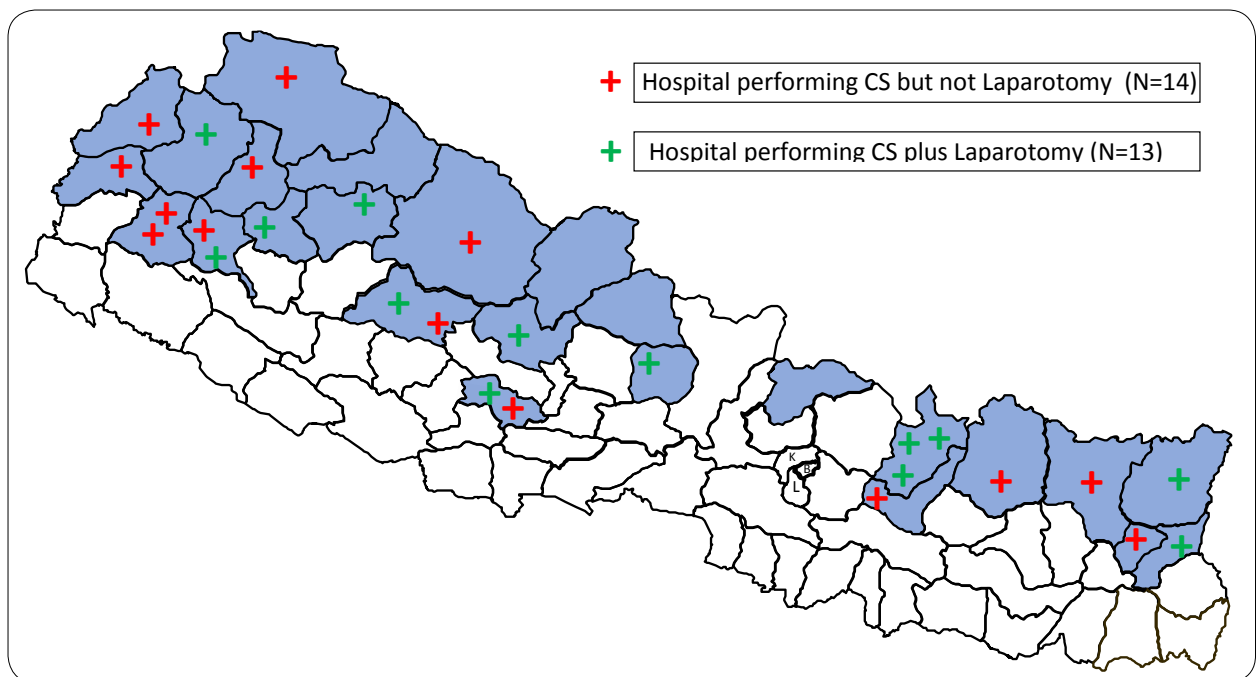


Figure 17 Hospitals performing CS and Laparotomy

**The presence of an MDGP was significantly associated with performing a Bellwether procedure (CS and laparotomy).**

Hospital type, Type of support given to the hospital, and presence of specialist surgeon were not associated (the latter probably because a gynae surgeon generally cannot perform a GI laparotomy).

A key question is how to progress CS hospitals to laparotomy hospitals.

# Functionality: By “Stepping Stone” Operations

These are mid-level operations which require a more skilled and confident surgical team and may act as a “stepping stone” to more complex and risky procedures (e.g. laparotomy). Procedures chosen

for this analysis are inguinal hernia repair, total abdominal hysterectomy and appendicectomy.

13 hospitals doing stepping stone operations are also doing laparotomy; 4 hospitals doing

stepping stone operations are not yet doing laparotomy.

**If hospital does all 3 stepping stones surgeries, there is a significant association with availability of laparotomy.**

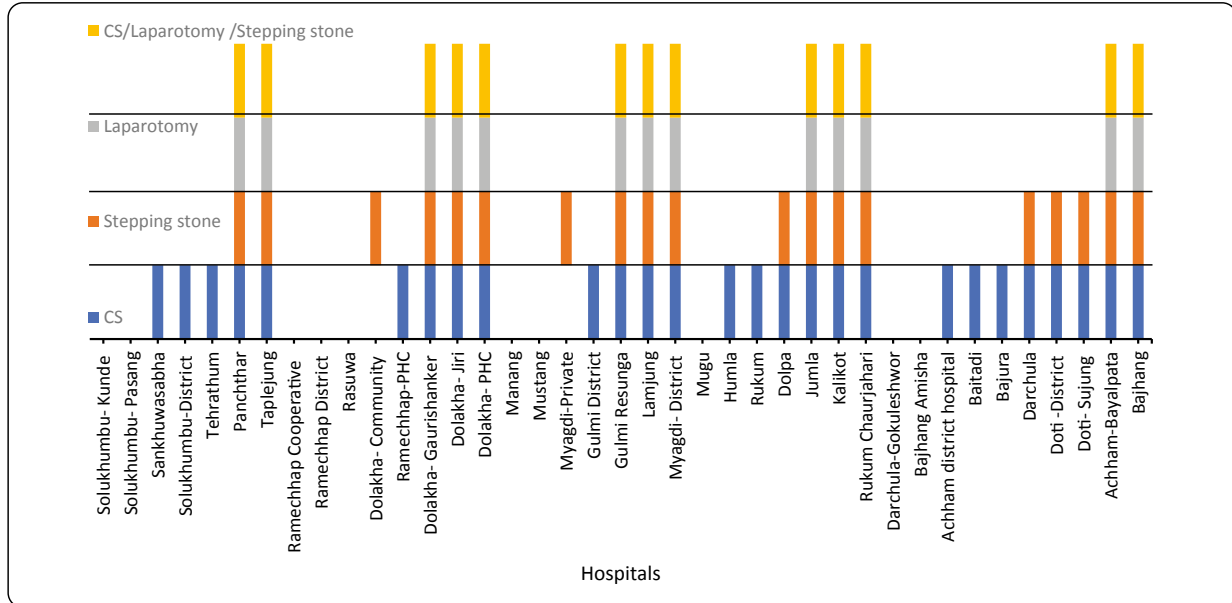


Figure 18 Hospitals Performing Stepping Stone Surgery, Laparotomy, Caesarean Sections





## Functionality: By culture at that hospital



# Conclusions and Recommendations

## Conclusions

This study provides direct ‘on the ground’ evidence from hospitals themselves of the state of current surgical activity in remote districts.

Surgery can be done in these remote districts but there remain surgically "empty" districts.

Overall rates of major operations are low but CS rates are better than the national mean in some districts, even meeting estimated need in one district.

Complex high-risk surgery such as laparotomy can be done but numbers are very low; there is very little operative orthopaedics at district hospitals outside of camps.

Generally, population access for CS is high and reasonable for Bellwether operations; full demand side studies, including expenditure, would give a truer picture of access and hence, that of effective coverage.

Generalist SAO doctors (e.g. MDGP) and task sharing health workers are beginning to successfully fill the HRS gap as Specialist SAO numbers are very low; the presence of an MDGP is significantly associated with CS availability.

The enabling environment for surgery was not adequate in many hospitals.

Successful hospitals have humble motivated teams, good managerial and community support, are often MDGP- led and on a pathway to being Bellwether capable by doing stepping stone operations (perhaps under GA).

Finally, Lancet Commission indicators can be applied in Nepal but are not currently used nor are yet specific enough for Nepal’s remote districts.

## Recommendations

- Skilled human resources and the enabling environment for surgery must be urgently improved up to the minimum standard to meet surgical need.
- Monitoring progression to adequate surgical coverage must be embedded in HMIS and national reporting with prospective data collection based on adapted surgical data-tools and LCoGS international indicators.

- CEONC based on an MDGP-led generalist surgical team represents a current model of success which should be up-scaled and re-termed CESC (Comprehensive Emergency Surgical Care) to encompass all essential district surgery, until there are sufficient surgical specialists.
- This generalist team should be supported to perform other surgeries, including

- stepping stone procedures (appendicectomy, hernia, abdominal hysterectomy) to move from CS- capable to laparotomy and operative orthopaedic-capable team (full Bellwether access).
- A National Surgical Plan should be made for Nepal building on these recommendations.

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