Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development

The Lancet Commission on Global Surgery

EVIDENCE AND SOLUTIONS FOR ACHIEVING HEALTH, WELFARE, AND ECONOMIC DEVELOPMENT

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The Lancet Commission on Global Surgery
Global surgery 2030: evidence and solutions for achieving health, welfare, and economic development

The Lancet Commission on Global Surgery

"Universal access to safe, affordable surgical and anaesthesia care when needed."

A Commission by The Lancet

@GSCommission

The Lancet Commission on Global Surgery
The Lancet Commissions

Inform and drive policy change
Generate broad sustainable improvement in global health
The Lancet
Richard Horton
Editor-in-Chief

Status Quo
Key Messages
Recommendations
Indicators/metrics

Inform and drive policy change
Address the gross inequities – improve global health
**Process**

Vision: Universal access to safe, affordable surgical and anesthesia care when needed

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston</td>
<td>January</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>June</td>
</tr>
<tr>
<td>Dubai</td>
<td>November</td>
</tr>
<tr>
<td>Bellagio</td>
<td>Feb 2015</td>
</tr>
</tbody>
</table>

Regional meetings:
- South/Central America
- Asia/Pacific
- Australia
- India
- Middle East/Gulf
- Sub-Saharan Africa
- Europe
Improved health & health equity for all

Scope

Global Surgery

Underserved Populations

- LMICs
- HICs

Populations in Crisis

- Conflict & Displacement
- Disaster
Collaborators in over 110 countries
Over 100 publications/abstracts
Healthcare Delivery & Management

Workforce Training & Education

Information Management

Finance & Economics

Key Messages
Recommendations
Indicators

National Surgical Plan
5 Billion
cannot access
safe surgery
when needed
Interpretation: Probability

\[ p(\text{Access}) = p(T \cap C \cap S \cap A) \]

Probability of access is the joint probability of timely care, surgical capacity, safe surgery, and affordability.
Surgical Workforce & Health Outcomes
SAO providers/100,000

**FIGURE 1.** The relation between MMR and density of surgical providers in 143 countries with available data. Logarithmic trendline used to show the gradient of improvement in MMR as providers increase.
Surgical Workforce - Shortage

44% of people in the world live in countries with SAO density < 20/100k

+1.27 million providers needed by 2030 to reach 20/100k

72% of people in the world live in countries with SAO density < 40/100k

+2.28 million providers needed by 2030 to reach 40/100k
143 million more procedures needed annually at minimum

Poorest $\frac{1}{3}$rd of the world’s population receives 6.3% of worldwide procedures
Surgical Volume & Health Outcomes
Surgical procedures/100,000
THE SURGICAL SYSTEM AND THE THREE DELAYS

The 1st Delay
Delay in Seeking Care

The 2nd Delay
Delay in Reaching Care

The 3rd Delay
Delay in Receiving Care

Referral system
Community
Informal healthcare providers and community health worker network, connected to broader health system

Primary health centre
Well connected to the first-level hospital through efficient communications and reliable referral

First level (District) hospital
The core site for surgical and anesthesia care delivery

Higher-level (e.g., secondary and tertiary) hospital
Hub for system-wide clinical, education, and research support
Centres for care specialisation

Indicates flow of patients and information
Hospitals that can consistently provide the Bellwether Procedures are likely staffed and equipped, and function at a level of complexity that enables the delivery of other, related surgical care.
B  General surgical procedure provision

- Provides laparotomy (n=577)
- Does not provide laparotomy (n=432)

Hospitals that provide surgical procedure (%)

- Biopsy
- Incision and drainage of abscess
- Male circumcision
- Removal of foreign body
- Suturing of wounds
- Wound debridement
- Appendectomy
- Contracture release and skin grafting
- Hernia
- Hydrocele
33 million

Individuals face catastrophic expenditures paying for surgery & anaesthesia annually

+ 48 million = 81 million
MORE THAN 3 BILLION PEOPLE LIVE ON LESS THAN $2.50 PER DAY
Financial Risk Protection
Risk pooling - Prepayment preferable to user fees

Time-critical and life- or limb-threatening

Unpredictable, cannot plan or save for financial consequences

User fees are often high and can be catastrophic
Investing in surgery is affordable, saves lives, & promotes economic growth.
Cost of Surgical Expansion (2015-2030)

$350,000,000,000,000
Total GDP Losses (2015-2030)

$12,300,000,000,000,000


The economic burden of malaria.
Gallup JL¹, Sachs JD.

Abstract
Malaria and poverty are intimately connected. Countries with intensive malaria had income levels in 1980 that were 20% lower than the world average. Therefore, the more efficient malaria mosquito vectors are, the more severe the burden is in tropical countries. Countries most severely affected tropical countries have one of the highest growth rates in the neighboring countries. Cross-country level, Malaria growth. Taking into account initial poverty, each year the economy grew 1.3% less per person per year.
Financial Transparency
Spending on Surgery

958 National Health Accounts from 1996-2010

Only Georgia & Kyrgyzstan reported surgical spending
Surgery is an indivisible, indispensable part of health care.
28-32% of the global burden of disease is from surgical conditions.
Data - Surgical indicators are lacking
NATIONAL SURGICAL PLAN

<table>
<thead>
<tr>
<th>Infrastructure</th>
<th>Recommendations</th>
<th>Assessment methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical facilities, facility readiness, and surgical system support</td>
<td>Track number and distribution of surgical facilities</td>
<td>Proportion of population with 2-h access to first-level facility</td>
</tr>
<tr>
<td></td>
<td>Negotiate central procurement agreements with decentralized entry</td>
<td>HIM: hospital management, tracking, assessment of structure, diversity, water, oxygen, surgical equipment and supplies, computer and internet</td>
</tr>
<tr>
<td></td>
<td>Develop national逝old plan</td>
<td>Proportion of hospitals fulfilling scale-up criteria</td>
</tr>
<tr>
<td></td>
<td>Reduce barriers to access through enhanced connectivity across entire care delivery chain to community and tertiary care</td>
<td>Blood bank delivery, registration rates</td>
</tr>
<tr>
<td>Workforce</td>
<td>Establish referral systems with community integration, transfer crisis, referral, and pre-referral for first responders and nearby members of the public</td>
<td>Surgical team coverage, uptake, and outcomes</td>
</tr>
<tr>
<td>Surgical, anaesthetic, and obstetric providers, allied health providers, nursing, and laboratory, pathology, and laboratory technicians</td>
<td>Establish training and education strategy based on population and needs of country</td>
<td>Establish referral systems with community integration, transfer crisis, referral, and pre-referral for first responders and nearby members of the public</td>
</tr>
<tr>
<td></td>
<td>Develop a context-appropriate licensing and credentialing requirement for all surgical workforce</td>
<td>Surgical team coverage, uptake, and outcomes</td>
</tr>
<tr>
<td></td>
<td>Training and education strategy of ancillary staff based on population and needs of country</td>
<td>Establish referral systems with community integration, transfer crisis, referral, and pre-referral for first responders and nearby members of the public</td>
</tr>
<tr>
<td></td>
<td>Invest in professional health-care management training</td>
<td>Surgical team coverage, uptake, and outcomes</td>
</tr>
<tr>
<td></td>
<td>Establish hospital equipment training programme</td>
<td>Establish referral systems with community integration, transfer crisis, referral, and pre-referral for first responders and nearby members of the public</td>
</tr>
<tr>
<td>Surgical volumes, system coordination, quality and safety</td>
<td>All-level hospitals should provide laparoscopic, cesarean delivery, and open surgery (similar to the National Emergency Department)</td>
<td>Establish referral systems with community integration, transfer crisis, referral, and pre-referral for first responders and nearby members of the public</td>
</tr>
<tr>
<td></td>
<td>Integrate public and private HPS providers into common national delivery framework</td>
<td>Establish referral systems with community integration, transfer crisis, referral, and pre-referral for first responders and nearby members of the public</td>
</tr>
<tr>
<td></td>
<td>Prioritize health-care management training</td>
<td>Establish referral systems with community integration, transfer crisis, referral, and pre-referral for first responders and nearby members of the public</td>
</tr>
<tr>
<td></td>
<td>Prioritize quality improvement processes and outcomes monitoring</td>
<td>Establish referral systems with community integration, transfer crisis, referral, and pre-referral for first responders and nearby members of the public</td>
</tr>
<tr>
<td></td>
<td>Provide telemedicine to build remote areas connectivity</td>
<td>Establish referral systems with community integration, transfer crisis, referral, and pre-referral for first responders and nearby members of the public</td>
</tr>
<tr>
<td></td>
<td>Promote systems-wide connectivity to technical applications, clinical support, and education</td>
<td>Establish referral systems with community integration, transfer crisis, referral, and pre-referral for first responders and nearby members of the public</td>
</tr>
<tr>
<td>Finishing</td>
<td>Core basic surgical packages within national health coverage</td>
<td>Proportion of surgical facilities offering the Shulman's Procedure</td>
</tr>
<tr>
<td></td>
<td>Risk-pooled with single-payer, mixed-use fees at all levels of care</td>
<td>Proportion of surgical facilities offering the Shulman's Procedure</td>
</tr>
<tr>
<td></td>
<td>Target financial flows for surgery through national health accounts</td>
<td>Proportion of surgical facilities offering the Shulman's Procedure</td>
</tr>
<tr>
<td></td>
<td>Universal-based purchasing with risk-pooled funds</td>
<td>Proportion of surgical facilities offering the Shulman's Procedure</td>
</tr>
<tr>
<td>Information management</td>
<td>Develop robust information systems to monitor clinical processes, cost, outcomes, and quality defects</td>
<td>Proportion of surgical facilities offering the Shulman's Procedure</td>
</tr>
<tr>
<td></td>
<td>Identify, track, and trend surgical research priorities of local relevance</td>
<td>Proportion of surgical facilities offering the Shulman's Procedure</td>
</tr>
</tbody>
</table>

Table 2: National surgical plan components and framework

- INFRASTRUCTURE
- WORKFORCE
- SERVICE DELIVERY
- FINANCING
- INFORMATION MANAGEMENT
Lancet Commission on Global Surgery Indicators

Republic of Zambia

@emakasa
75% of the Zambian population lives within 2-hr driving distance of a first-level hospital or higher
Zambia places fairly well in 2-h access
Zambia has low surgical workforce density

Surgeons: 97
Anesthesiologists: 13
Obstetricians: 46
Total: 156

Zambian Population: 14,100,000

1.1 SAO/100,000

LCoGS Target: 20-40 SAOs/100,000

Workforce Indicator
There is large unmet need for surgery

<table>
<thead>
<tr>
<th>Met and Unmet Need for Surgery</th>
<th>Total minimum need</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Absolute volume</td>
<td>864,900</td>
</tr>
<tr>
<td></td>
<td>Volume per 100,000</td>
<td>6,145</td>
</tr>
<tr>
<td>Unmet need</td>
<td>Met Need</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Absolute volume</td>
<td>227,594</td>
</tr>
<tr>
<td></td>
<td>Volume per 100,000</td>
<td>1,617</td>
</tr>
<tr>
<td></td>
<td>Unmet need</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Absolute volume</td>
<td>637,306</td>
</tr>
<tr>
<td></td>
<td>Volume per 100,000</td>
<td>4,528</td>
</tr>
</tbody>
</table>
Most surgical procedures can be “catastrophic” (even without inclusion of non-medical costs)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circumcision</td>
<td>$2.69</td>
</tr>
<tr>
<td>“Simple small surgery”</td>
<td>$20.19</td>
</tr>
<tr>
<td>Delivery</td>
<td>$80.75</td>
</tr>
<tr>
<td>Complicated delivery</td>
<td>$269.18</td>
</tr>
<tr>
<td>“Minor procedure”</td>
<td>$336.48</td>
</tr>
<tr>
<td>ENT procedure</td>
<td>$403.77</td>
</tr>
<tr>
<td>Bellwether Procedure (C-delivery)</td>
<td>$1,413.20</td>
</tr>
<tr>
<td>Neurosurgery</td>
<td>$6,729.50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Household ‘Capacity to Pay’</th>
<th>Catastrophic Expenditure Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>$303</td>
</tr>
<tr>
<td>Urban</td>
<td>$1652</td>
</tr>
</tbody>
</table>
If you include non medical costs – both figures approach 100%

56% chance of catastrophic expense from surgery

94% chance of impoverishment from C-delivery
1.8% loss in GDP per annum
The LCoGS Core Indicators for Zambia

INDICATOR 1: 2h Access*
- Up to 75%

INDICATOR 2: SAO Density
- 1.1

INDICATOR 3: Surgical Vol.
- 1617 (6145)

INDICATOR 4: POMR
- ?

INDICATOR 5: Impov. Exp. C-delivery
- 94%

INDICATOR 6: Catastrophic Exp. Surgery
- 56%
GLOBAL SURGERY 2030
EVIDENCE AND SOLUTIONS FOR ACHIEVING
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THE LANCET
LCoGS Implementation Strategy

LCoGS Indicator Collection → World Bank World Development Indicators

National Surgical Forums → National Surgical Plans

The Lancet Commission on Global Surgery
• Data collection can be burdensome
• Data asks must be responsible
THE WHO GLOBAL REFERENCE LIST OF 100 CORE HEALTH INDICATORS
## THE WORLD DEVELOPMENT

### Health

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adolescent fertility rate (births per 1,000 women ages 15-19)</td>
<td>Mortality rate, infant (per 1,000 live births)</td>
</tr>
<tr>
<td>Birth rate, crude (per 1,000 people)</td>
<td>Mortality rate, under-5 (per 1,000 live births)</td>
</tr>
<tr>
<td>Births attended by skilled health staff (% of total)</td>
<td>Out-of-pocket health expenditure (% of private expenditure on health)</td>
</tr>
<tr>
<td>Contraceptive prevalence (% of women ages 15-49)</td>
<td>Population ages 0-14 (% of total)</td>
</tr>
<tr>
<td>Death rate, crude (per 1,000 people)</td>
<td>Population ages 15-64 (% of total)</td>
</tr>
<tr>
<td>Fertility rate, total (births per woman)</td>
<td>Population ages 65 and above (% of total)</td>
</tr>
<tr>
<td>Health expenditure per capita (current US$)</td>
<td>Population, female (% of total)</td>
</tr>
<tr>
<td>Health expenditure, public (% of total health expenditure)</td>
<td>Population growth (annual %)</td>
</tr>
<tr>
<td>Health expenditure, total (% of GDP)</td>
<td>Population, total</td>
</tr>
<tr>
<td>Immunization, DPT (% of children ages 12-23 months)</td>
<td>Pregnant women receiving prenatal care (%)</td>
</tr>
<tr>
<td>Immunization, measles (% of children ages 12-23 months)</td>
<td>Prevalence of HIV, female (% ages 15-24)</td>
</tr>
<tr>
<td>Improved sanitation facilities (% of population with access)</td>
<td>Prevalence of HIV, male (% ages 15-24)</td>
</tr>
<tr>
<td>Improved sanitation facilities, urban (% of urban population with access)</td>
<td>Prevalence of HIV, total (% of population ages 15-49)</td>
</tr>
<tr>
<td>Incidence of tuberculosis (per 100,000 people)</td>
<td>Prevalence of stunting, height for age (% of children under 5)</td>
</tr>
<tr>
<td>Life expectancy at birth, female (years)</td>
<td>Prevalence of underweight, weight for age (% of children under 5)</td>
</tr>
<tr>
<td>Life expectancy at birth, male (years)</td>
<td>Teenage mothers (% of women ages 15-19 who have had children or are currently pregnant)</td>
</tr>
<tr>
<td>Life expectancy at birth, total (years)</td>
<td>Unmet need for contraception (% of married women ages 15-49)</td>
</tr>
<tr>
<td>Maternal mortality rate (modeled estimate, per 100,000 live births)</td>
<td></td>
</tr>
</tbody>
</table>

### Infrastructure

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air transport, registered carrier departures worldwide</td>
<td>Internet users (per 100 people)</td>
</tr>
</tbody>
</table>
GLOBAL INDICATOR

- CONTACTED (ALMOST) EVERY COUNTRY IN THE WORLD
- ACTIVELY ENGAGED OVER HALF (~120)
- SO FAR, OBTAINED DATA FROM ~70
• WHO endorsement
• Several countries underway

National Surgical Plan

LCoGS Indicators

• WHO endorsement
• World Bank WDIs

Strategic Priorities

Financial Risk Protection

Financial Transparency

• Govt leaders
• MOH & MOF

• National Health Accounts
• Grants
• NGOs
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