Measuring Access and the Impact of Access on Outcomes: A Case-Study of C-Sections in Rural Rwanda

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5 BILLION cannot access safe surgery when needed

THE LANCET Commission on Global Surgery
What does **access** mean?

Why do 5 billion people lack access to surgery?
Kirehe District Hospital as a case study for access dimensions

- Are C-sections accessible and affordable?
- What are the facilitators and barriers to high quality care and good maternal/neonatal outcomes?
Safety: mHealth surgical site infection surveillance

Background

• SSIs are the most common healthcare associated infections in LMICs, with rates many-fold higher than in HIC
• Contribute considerable morbidity, mortality, costs, prolonged hospital stays

Kirehe District hospital

• Covers 340k, 233 beds, 15 physicians
• District C-section rate 7.8%
Study Goals and Objectives

• Develop a simple screening algorithm to identify post-c-section surgical site infections (SSIs), implemented on tablets

• Assess the feasibility and impact of a community health worker (CHW) intervention to help women with SSIs return to care.
SSI Screening Protocol

Optimization

Standard of Care

CHWs + Home Visits + Protocol

CHW + Phone Calls + Protocol

Phase 1, n=560

Phase 2, n=1050
Key results from the RCT

Diagnostic tool
- In the clinic setting, the combination of fever/pain/discolored drainage had good accuracy to identify SSI (sensitivity=76.2%; specificity=81.4%).
- However, tool did not perform well in the home setting.

Feasibility of a CHW follow-up post-c-section
- The in-person follow-up was feasible (87.8% were completed);
- The phone-based follow-up had numerous gaps (68.6% completed).

Impact of CHW follow-up
- Return to health-center was high across all arms, and there was no significant difference by type of follow-up.
Affordability - background

81 million face catastrophic expenditures paying for surgery and anaesthesia annually

33 million

48 million

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Affordability of inpatient care

Method

- 346 women surveyed at discharge and cross-referenced with billing data

Results

- 93% had mutuelle, that covers 90% of medical expenses
- Despite the national health insurance, 10-25% of patients had catastrophic expenditure, up to 50% if lost wages are included
- 49% borrowed money to pay for surgery
- 12% sold possessions
- 9% had unpaid balance at time of discharge

Financial Risk Protection in C-Section Patients at a District Hospital in Rural Rwanda, R. Koch et al
Affordability after discharge

Background
- After discharge, many patients very near catastrophic expense
- Yet the added financial burden of post-operative care generally not included in studies
- Higher transport costs significantly associated with higher rates of SSI (OR 2.42)

Methods
- Utilize data from the mHealth trial to simulate the result of shifting follow-up from the health centers to the CHWs
- Allows for the quantification of both potential health outcomes and undue financial burden on patients
- Markov model simulating 1 m patients in a daily cycle
Dual goals of shifting follow-up:
  • Reduce burden on patient of follow up
  • Enable more timely treatment for SSIs
Affordability after discharge

- In an already very financially vulnerable population, the estimated incidence of catastrophic expenditure doubles when post-discharge costs are included, largely as a result of repeated travel costs.

- Post-C-section follow-up via CHW would decrease catastrophic expense.
Timeliness affects access

Method

• All recorded C-sections in 1 year were used to calculate population rate of C-section by health center catchment area

Results

• Significantly lower rates of C-section in health center catchment areas that are further away from the hospital
Timeliness affects outcomes

Method

- Retrospective review of 441 mother-neonate pairs after emergency C-section
- Poor neonatal outcome defined as APGAR <7 at 5 minutes or death

Results

- The longer the distance from health center to district hospital, the worse the outcomes

2 hour access in Rwanda estimated to be 96%-100%.

2 hour access in sub-Saharan Africa estimated at 71-92%

One of 6 recommended key indicators from the Lancet Commission on Global Surgery
Timeliness – GIS validation

Commonly employed GIS model off by 50%

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