The 12 trillion dollar question: is global surgery cost effective?

This article considers the financial gain of providing global access to safe and affordable surgical care, especially in low and middle income countries.

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According to the Lancet Commission on Global Surgery, five billion people in the world lack access to safe and affordable surgical and anaesthesia care when needed. The global burden of surgery (which is an estimate of the proportion of conditions that are surgically treatable in a specific geographic area) disproportionately affects low and middle income countries (LMICs). Without surgical care, mortality and morbidity rates are high for many common and easily treatable conditions such as hernias, appendicitis and breast cancer. With the growing burden of surgery from non-communicable diseases such as cancer, cardiovascular and metabolic diseases, the need for surgical services will continue to rise. Global surgery therefore entails all efforts to increase access to safe, affordable and timely surgical and anaesthesia care, especially in LMICs.

MEASURING COST EFFECTIVENESS IN GLOBAL SURGERY
There are multiple concerns surrounding global surgery interventions in LMICs despite many studies that have demonstrated the cost effectiveness of this movement. While the cost effectiveness across all interventions may not be uniform, studies suggest that those that treat conditions that are common in a geographic region are often the most cost effective.

Cost effectiveness is a measure of how much it would cost to obtain one unit of benefit from an intervention over the benefit that is already obtained from the cost seen in the status quo. Simply put, the most cost effective intervention is one that requires the least amount of money to obtain the outcome of safe, affordable and timely surgery.

A study was conducted by the Lancet Commission to assess the financial feasibility and economic effect of surgical expansion. The study calculated that without global surgery investment, the value of lost output due to surgical conditions would amount to approximately $12.3 trillion in LMICs by 2030. In other words, global surgery interventions aim for better access to safe surgical care when needed as well as the prevention of impoverishing expenditure from surgical care costs and long hospital stays. Without global surgery interventions, the cumulative lag in these aspects for surgically treatable conditions would cost world economies $12.3 trillion.

IS GLOBAL SURGERY COST EFFECTIVE?
All illness affects a country’s labour supply and capital stock, which in turn are related to aggregate economic output over time. Factors such as working hours lost owing to prolonged hospital stays and the expense of surgical infections contribute to this staggering potential loss. Despite the total costs for expanding surgical services by 2030 estimated to be up to $420 billion (with optimistic rates of growth in surgical care), research studies suggest that surgery is still a highly cost effective intervention. This illustrates the value for money of global surgery initiatives as it would cost less than 4% of the possible economic loss to invest in an intervention that yields better outcomes than those achieved without the intervention. As a result, expansion of surgical care may lead to substantial economic gains on investment.

In a study that collected data on surgical interventions, the cost effectiveness of surgical interventions compared favourably against some traditional public health strategies in LMICs. In this study, the median cost effectiveness ratios for male circumcision in Africa, cataract repair in Nepal and inguinal hernia repair in Ghana were similar to that of the World Health Organization’s Expanded Programme on Immunization and bed nets for malaria prevention, while the median cost effectiveness ratios of cleft lip/palate repair, general surgery, hydrocephalus repair and ophthalmic surgery were similar to that of the bacillus Calmette–Guérin vaccine.

HOW CAN WE FINANCE GLOBAL SURGERY?
Even though cost effectiveness has been demonstrated, strategies to finance global surgery in LMICs may be challenging as there is insufficient focus on funding set...
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Aside specifically for surgery. This is despite the extensive financial support for other primary healthcare conditions (human immunodeficiency virus, tuberculosis, malaria etc). Funding global surgery is likely to be most effective if surgery is incorporated as a basic primary healthcare need of the population. National health financing has three major sources:

- the public sector (revenues from taxation, social security contributions);
- the private sector (out-of-pocket payments, private insurance);
- external sources (grants from international funding agencies).[^4]

A combination of these may be used by a LMIC to finance global surgery. A risk pooling mechanism (such as national health insurance from taxation) may not work on its own as a vast proportion of the population in LMICs subsist on a low income and live in rural areas, and informal non-taxable employment is high. Private funding ensures that only the wealthy are healthy. However, if a percentage of private sector funding is ringfenced to contribute to public sector funding as compulsory tax, then the poor may also benefit.

Partnerships with international organisations would create ideal links that may subsequently secure funding/grants for global surgery projects where a mutual interest is shared. Critically, having learnt that financial restrictions are important barriers to surgical care seeking behaviour and surgical care delivery, the money raised should aim to eliminate expenses that prevent patients from receiving care (direct and indirect costs), as well as to motivate healthcare workers by further training them and providing financial incentives.

**CONCLUSIONS**

Although implementation challenges are highly likely given the cost of expanding surgical services mainly in human resources (training, education, compensation) and infrastructure (operating rooms and equipment, anaesthesia, electrical power), it is worth considering that without such surgical investment, the loss of lives and lack of economic development will be much larger and longer lived.

**References**