

# **Surgical site infection after gastrointestinal surgery in high-income, middle-income, and low-income countries: a prospective, international, multicentre cohort study**

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Lay Summary

## ***Patients in Low Income Countries 60% more likely to suffer a surgical site infection***

Surgical site infection (SSI), where the surgical wound becomes infected, is the most common complication following operations; it causes significant pain and a prolonged recovery time for patients.

SSI places a significant financial burden on healthcare systems in all countries, but for patients in low and middle income countries (LMIC) whose treatment is often self-funded, this can be catastrophic as treatment costs are compounded by lost working days.

Most data relating to SSI has been collected in high income countries and standardised, internationally comparable data on SSI in low income countries is lacking. This knowledge gap makes strategic planning and allocation of resources to tackle SSI in LMIC challenging.

The GlobalSurg Collaborative takes an innovative approach to healthcare data collection and has formed an international network of surgical researchers. Recruited by social media, the ethos of GlobalSurg is inclusive and collaborative; any healthcare facility anywhere in the world treating patients that meet the inclusion criteria of the study are eligible to take part. Using this network to 'professionally crowd source' data, this study aimed to determine the variability of SSI rates in high, middle and low income countries.

Between January and July 2016, researchers around the world entered data on 12,539 patients undergoing abdominal surgery from 343 hospitals in 66 countries. 58.5% of patients were from high income countries (193 hospitals in 30 countries), 31.2% from middle income countries (82 hospitals in 18 countries) and 10.2% from low income countries (68 hospitals in 18 countries).

The study found the number of patients suffering an SSI within 30 days of their operation, increased from 9.4% in high income countries, to 14.0% in middle income countries, and 23.2% in low income countries. Even after adjusting for confounding factors, the study demonstrated that patients in low income countries are 60% more likely to suffer a surgical site infection after an operation than those in high or middle income countries. Those who developed an SSI were more likely to die, to require a second operation, to develop a further infection, and spent at least three times as long in hospital compared to those without an SSI.

These findings were despite the greater consumption of antibiotics both before and after operations in low income countries, with 50% of patients receiving antibiotics for 5 or more days after their operation, compared with 25% of patients doing so in high income countries. Testing the bacteria responsible for the surgical site infection was possible in 610 patients with an SSI. 21.6% of these patients were found to have a bacterial infection that was resistant to the prophylactic antibiotic administered before their operation. Furthermore, the rate of antibiotic resistant bacteria was higher in low income countries compared to high income countries.

In addition to the novel way this data has been collected, GlobalSurg are increasing access to their data by developing a freely available interactive 'data explorer' application (<http://ssi.globalsurg.org>) which allows users to fully explore the aggregate data entered into the study.

Overall, this study provides high quality evidence that patients in low income countries carry a significant burden of global surgical site infections. Such high quality evidence provides the rationale to plan, fund and perform high quality surgical research such as multi-centre, multi-country randomised controlled trials that can effect change in healthcare policy.