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Global burden of postoperative death

The *Lancet* Commission on Global Surgery¹ identified that 313 million surgical procedures are performed worldwide each year. Little is known about the quality of surgery globally because robust reports of postoperative death rates are available for only 29 countries.² The rate of postoperative deaths is a measure of the success of surgical care systems, and improving this metric is a global priority.

We aimed to estimate, on the basis of surgical volume, case mix, and postoperative death rates adjusted for country-income level, how many people around the world die within 30 days of surgery. England's combined Hospital Episode Statistics and Office of National Statistics (HES-ONS) dataset is one of the world's most comprehensive procedure-specific resources on mortality, reporting national coverage from a universal health-care system. We used the HES-ONS dataset as the baseline for our estimations for high-income settings and adjusted case-mix and mortality in HES-ONS to estimate total postoperative deaths in low-income and middle-income countries (LMICs). We estimated probable additional postoperative deaths if surgical volume were expanded to address the annual unmet need for 143 million surgical procedures in LMICs (appendix).³

Our analysis suggests that at least 4.2 million people worldwide die within 30 days of surgery each year, and half of these deaths occur in LMICs. This number of postoperative deaths accounts for 7.7% of all deaths globally,⁴ making it the third greatest contributor to deaths, after ischaemic heart disease and stroke (figure). More people die within 30 days of surgery annually than from all causes related to HIV, malaria, and tuberculosis combined (2.97 million deaths).⁴ We project that an expansion of surgical services to address unmet need would increase total global deaths to 6.1 million annually, of which 1.9 million deaths would be in LMICs.

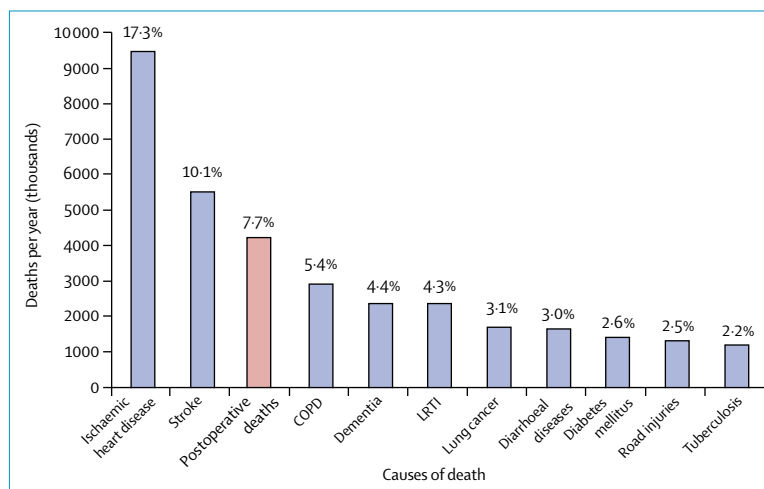


Figure: Top ten global causes of death, 2016

Percentages are the proportion of total global deaths attributable to each cause. Data, except those on postoperative deaths, are from the Global Burden of Disease Study 2016.⁴ COPD=chronic obstructive pulmonary disease. LRTI=lower respiratory tract infections.

Our analytical approach is limited by several necessary assumptions (appendix). For example, HES-ONS reports some of the lowest postoperative death rates in the world. Basing our calculation on postoperative death rates with higher baselines than other high-income countries substantially increases our projections of total postoperative deaths.

Although there is a pressing need to expand surgical services to populations that are underserved, this expansion must be done in tandem with initiatives to reduce postoperative deaths. Funders and policy makers should prioritise research that aims to make surgery safer, particularly in LMICs. Routine measurement of surgical outcomes is essential to monitoring global progress in addressing the burden of postoperative deaths.

We declare no competing interests. DN and AB conducted the data analysis and interpretation and had access to all data. DN, JM, BB, AM, and AB drafted the manuscript. Collaborators listed in the appendix revised the manuscript, approved the final draft, and approved the decision to submit the manuscript. AB is the guarantor for this report. This Correspondence was funded by a National Institute for Health Research (NIHR) Global Health Research Unit Grant (NIHR 17-0799). The funder had no role in the study design, data collection, analysis, interpretation, or the writing of this Correspondence. The funder has approved the submission of this Correspondence for publication. The views expressed are those of the authors and

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†Collaborators are listed in the appendix

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