Selected Summaries

Emergency surgical care for the rural poor

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SUMMARY

Dare *et al.* contribute a valuable population-based study quantifying the mortality from surgical conditions, specifically acute abdominal illnesses, and link it with geographical access to surgical care of varying levels of quality in India.

This study has drawn on data collected as part of the Million Death Study which aims to determine the cause of death in 1.1 million nationally representative households based on verbal autopsy that was reviewed by a trained physician. Acute abdominal conditions were defined as time critical conditions that require definitive surgical interventions within 24 hours of onset of symptoms, as reported by a lay person, to prevent death. The quality of available surgical services at each of the 565 district hospitals were classified into basic (no emergency surgery capability, *n*=182), intermediate (24-hour surgical and anaesthesia services, *n*=132) and well-resourced (24-hour surgical and anaesthesia plus critical care, blood banking, basic laboratory and radiology services, *n*=225) using data from the District Level Household Survey (DLHS-3). The geographical location of each death was ascertained with the postal code (PIN) using data from the Global Rural–Urban Mapping project and district hospitals were geographically coded. The relationship between geographical access, quality of the facility, and the risk of death from an acute abdominal condition was estimated using multivariate regression, which adjusted the association for possible confounders such as socioeconomic status. There were 923 deaths attributed to acute abdominal conditions, constituting 1.1% of the 86 806 total study deaths. Adjusting for sampling and extrapolating to the national death total of 2010, would produce an estimate of 72 000 deaths from acute abdominal conditions in India per year. The majority of these deaths were attributed to peptic ulcer disease (79%); 87% occurred among rural households, and only 21% happened in a hospital. The median age of death was 53 years, and two-thirds of deaths were among men. Areas where these deaths occurred were likely to be poorer and were clustered mainly within the poorer eastern and central states of Odisha, Tripura, West Bengal, Madhya Pradesh and Chhattisgarh. The mean age-standardized mortality rate differed up to 8.6-fold when comparing the highest mortality clusters to low mortality ones. Distance to the nearest district hospitals did not affect mortality if only basic or intermediate facilities were available. However, well-resourced district hospitals were farther from the high mortality clusters (54.5 km) than from low mortality clusters (32.5 km). The odds ratio of a postal code being a high mortality cluster increased remarkably with increasing distance from a well-resourced district hospital 3.2-fold for 50–99 km and rising to 16-fold for people living >100 km away from a well-resourced centre. As a control comparison, the authors report no relationship between geographical access and mortality from three surgical conditions that are not time critical, namely breast, uterine and oral cancers. Although 89% of Indians live within 50 km of any district hospital, only 57% live within 50 km of a well-resourced district hospital. Using the geographical distribution of deaths, the authors estimate that converting the death rates in high mortality clusters to that of the low morality ones, through the provision of well-resourced district hospitals, could prevent over 50 000 acute abdominal deaths each year.

COMMENT

The salient findings of the study are: (i) deaths due to acute abdominal conditions are more frequently seen in parts of India that do not have access to a well-resourced surgical facility (a district hospital); (ii) the greatest risk of dying from an acute abdomen was for people who lived more than 100 km from a well-resourced district hospital functioning 24 hours, seven days a week; and (iii) nearly two-thirds of these deaths can be prevented by providing a well-resourced and functioning district hospital within 50 km (ideally within 20 km) of every resident Indian. These results validate surgical need as an important and neglected health problem, at par with maternal mortality,[1] tuberculosis, malaria,[2] or snake bites.[3] The strengths of this study include its use of population representative data, compared to hospital-based studies, incorporating the quality of available services, and incorporating geography into the analysis.[4] The limitations of this study include using old mortality data as well as quality of the facility data that predate the National Rural Health Mission (NRHM), and the lack of validation data for verbal autopsy classified acute abdominal deaths. Additionally, findings of acute mortality are only the beginning. What about the smouldering abdomens, gangrenous limbs, faecal fistulas, and other unsuccessful surgical outcomes for which large expenses are often made with marginal relief, inability to work, chronic poverty, and the consequent deprivation of the entire family leading to a slow death? A complete assessment of the poor availability and quality of surgical care must include this perspective. Health intelligence is weak in many developing countries and sampling techniques limited to specific diagnoses can help fill these gaps. However, such estimates are an imperfect replacement for the routine reporting of deaths. Our experience at Jan Swasthya Sahyog, a community-based health programme in rural, central India, has taught us that the true burden of disease cannot be unmasked unless credible services are accessible, and to not depend upon the ability of the user to pay.

As the authors note, linear distance underestimates the actual challenge of access considering mountains, rivers, areas of conflict, and the lack of roads or public transport. Another layer of geography is the limitations imposed by state boundaries in defining the type of care and what an individual may have to pay with fragmented and diverse health insurance schemes. Among the poor, large-scale migration for work from rural hinterlands poses personal challenges, workers often live at the mercy of contractors, and this complicates care-giving if a family member at home falls sick. Geographical and economic barriers, thus

frequently overlap and the latter may be the larger barrier to accessing healthcare. Poverty itself leads to poor food availability which manifests as poor nutrition that ultimately produces poorer outcomes,[5] even when surgery is accessed. The finding that an overwhelming proportion of deaths occurred at home, when a much higher proportion of the population lives within the proximity of a well-resourced hospital, suggests that available services were not accessed because of other barriers. Even for public sector health facilities, out-of-pocket expenditures incurred remain high, discouraging citizens from accessing hospitals even when it is life-saving. Well-resourced facilities must also be free of charge at the point of care to fulfil any commitment of reaching the poorest. The recent National Sample Survey found that only 2% of rural respondents who were hospitalized for any indication could avail of even partial reimbursement from the much acclaimed public insurance scheme for the poor.[6]

A well-functioning surgical service within a reasonable geographical distance looks at the issue of access to healthcare through the lens of the three delays framework (deciding to seek care, reaching a medical facility, and receiving appropriate care), and attempts to intervene within the second and third delays.[7] With a meagre 1.1% of the gross domestic product allocated to health, it is unclear though how we could hope to eliminate even the physical infrastructure gaps. Even if hospitals are built, the key to quality services will remain well-trained, motivated human resources. The current group of trained surgeons zero in on the first-world modelled minimally invasive procedure to the exclusion of open procedures.

These procedures, which sell well in elite private hospitals, require high set-up costs and offer marginal benefits. We need a system of medical education and ethics planned for an equitable, inclusive and just healthcare system, one that preferentially accounts for the prolonged and shameful neglect of the rural poor. Well-resourced district hospitals should be the ideal breeding grounds for a fresh group of sympathetic doctors and other healthcare professionals.[8] These must include large numbers of superbly trained postgraduate doctors in family medicine and rural surgery. They need to have a wider spectrum of core competencies, transcend specialist-centric professional constructs, and should be well-equipped to provide quality care at the district setting.

In essence, developing a broad intervention, such as surgery, is daunting in under-resourced scenarios but also presents many opportunities. This complex service acts as an enabler for several other important healthcare services, indicating the availability of 'staff, space, stuff, and systems' in a responsive healthcare system, capable of meeting multiple health challenges.[9]

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Grip strength and mortality

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