A Critical Threshold for Global Pediatric Surgical Workforce Density

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Background

- 1.7 billion children worldwide lack access to surgical care, especially in low- (LIC) and low-middle income (LMIC) countries
- Among other indicators, specialist surgical workforce density (specialist surgeons, anesthesiologists, and obstetricians/100,000 population) is one marker of progress in global surgical access
- Surgical workforce density correlates with maternal mortality, with a critical threshold of 20 resulting in significant improvement in maternal survival

Specific Aims

(1) Compare PSWD with neonatal, infant and <5 childhood mortality rates
(2) Calculate the critical PSWD threshold associated with mortality reduction

Methods

- Using publicly available data, a convenience sample of 26 countries were evaluated with 2015-2019 data
- Countries varied in geography and World Bank income classification
- Data obtained:
  - Number of pediatric surgeons
  - Childhood (≤15 years) population
  - Neonatal mortality rate
  - Infant mortality rate
  - Under 5 mortality rate
- PSWD = # pediatric surgeons / 100,000 children
- Survival plotted as a function of PSWD
- Spearman’s correlations were conducted to evaluate the relationship between PSWD and neonatal, infant and <5 mortality

Results

- Pediatric surgical workforce density (PSWD) of 0.4/100,000 children correlates with improved survival of complex pediatric surgical conditions
- No studies exist on PSWD and pediatric-specific population mortality rates
- PSWD correlates with pediatric population-level mortality rates
- Critical threshold of PSWD ~0.3 per 100,000 children correlates with significant increase in survival
- This mirrors PSWD 0.4 for survival from pediatric surgical conditions
- Can serve as benchmark in tracking progress in pediatric surgical access and national health planning
- If not addressed in LMICs, where an even greater proportion of population is <15, many children will continue to die from preventable deaths each year
- PSWD is likely an indirect representation of a system with comprehensive resources for pediatric care, though pediatric surgeons remain an essential component of functional health systems

Discussion

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Next Steps

- Increase sample, including more countries
- Assess correlation with specialist anesthesia density
- Assess relationship between surgical volume and PSWD

Limitations

- Limited sample of 26 countries
- Recognize global infant and child mortality have multiple causes other than surgical conditions
- In some countries, unable to determine if providers practice year-round in country or are retired

References