Quantification of Global Burden of Pediatric Surgical Disease Using Disability Weights through International Partnership

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Background
The burden of surgical conditions, particularly congenital anomalies, is significantly high around the world.
- To quantify the burden of disease for global advocacy of limited healthcare resources, the World Health Organization developed the Disability-Adjusted Life Year (DALY) metric, which examines both mortality and morbidity.
- The DALY metric requires a disability weight (DW) for each condition, a measure between 0 (perfect health) and 1 (death).
- There is currently no data using this methodology for pediatric surgery, neither in Canada nor in Low and Middle Income Countries.

Objective
To provide a set of DWs for 15 congenital anomalies prevalent in both Kenyan and Canadian pediatric surgical patients within the Global Burden of Disease Framework.

Methods
78 Kenyan and 76 Canadian healthcare professionals and community members were recruited from Kijabe, Kenya and Hamilton, Canada from February to August 2012.
Focus groups were conducted and participants completed 4 exercises:
- Ordinal Ranking
- Visual Analogue Scale
- Time Trade-Off
- Person Trade-Off
DWs were subsequently derived from this data.

Results
Disability Weights for 15 Congenital Anomalies

DWs generated from each exercise were equally weighted to yield an average DW for each health state in both Kenya and Canada. An overall global DW was then determined by averaging the Kenyan and Canadian DWs.
- Overall DWs ranged from 0.15 to 0.98 (SD=0.0-0.17), with results fairly concordant between nations (p>0.50), except for a few disparities.
- Canadian DWs for cleft lip and palate (0.51, 0.25) were higher relative to Kenyan DWs (0.41, 0.19) (p<0.005, p<0.030).
- Severe hypospadias had a higher DW in Kenya (0.52) than in Canada (0.27) (p<0.001).

Discussion
No significant cross-cultural differences were detected in the Canadian and Kenyan DWs.
- Internal validity was confirmed through statistical analysis between exercises.
- External validity was demonstrated through correspondence of DWs with those from the Disease Control Priorities in Developing Countries Project (DCP2).
- Two sets of conditions (cleft lip/palate) received lower DWs in DCP2 than DAPS.
- Actual disabilities associated with these health states may presently be underestimated.

Conclusion
These findings demonstrate that burden of pediatric surgical disease is fairly concordant between Canada and Kenya.
- The use of more rigorous DW methodology is recommended.
- A novel set of DWs for 15 congenital anomalies was determined.
DWs will be used to calculate the Disability Adjusted Life Years averted by pediatric surgery to inform global health priority setting.

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