

## Theme: Pediatric Cardiology

**Postoperative infection in developing world congenital heart surgery programs: data from the International Quality Improvement Collaborative.** (*Circ Cardiovasc Qual Outcomes*. 2017;10.pii: e002935. doi: 10.1161/CIRCOUTCOMES.116.002935)

This is an important study that seeks to examine a critical issue that affects outcomes of children undergoing congenital heart surgery in low- and middle-income countries (LMIC). In this study from the International Quality Improvement Collaborative (IQIC) involving 14545 pediatric cardiac surgical cases from 27 participating sites in 16 LMICs, the incidence of bacterial sepsis was 5.5% and surgical site infections was 2.1%. Younger age at surgery, higher surgical complexity, lower oxygen saturation, and major medical illness were independent risk factors for infection.

In-hospital mortality was nearly three times higher among cases with infection than among those without infection (16.7% versus 5.3%;  $P < 0.001$ ), as were postoperative ventilation duration (80 versus 14 hours;  $P < 0.001$ ) and intensive care unit stay (216 versus 68 hours;  $P < 0.001$ ). The IQIC also implemented targeted educational programs for infection control during the period of data collection, and the infection rates declined significantly by about 50% over the two-year period. Simple infection control practices can be implemented at low costs in most health care settings with very impressive returns on investments in terms of improving outcomes and lowering costs of care.

A declining trend in infant mortality rate is now being witnessed in many LMICs, and this is largely attributable to reductions in mortality from communicable diseases. Congenital heart defects (CHD) have begun to surface as a significant health problem among infants and newborns in many LMICs that are now witnessing impressive improvements in human development indices. This phenomenon unmasked a massive burden of CHD in LMICs and a number of pediatric heart programs are being established. Postoperative infections contribute substantially to the mortality, morbidity, and costs after congenital heart surgery.

The International Quality Improvement Collaborative for Congenital Heart Surgery seeks to improve care in LMICs. It was initiated in 2008 by Boston Children's Hospital representatives, and other non-governmental organizations to address significant gaps that exist with care of children with CHD in LMICs when compared to advanced economies. The IQIC seeks to provide benchmark data for health care professionals and guides quality improvement efforts at over 50 sites in 22 LMICs.

This study used data from the large IQIC database and identified risk factors for postoperative infections after congenital heart surgery and demonstrated that simple and standardized quality improvement initiatives that use knowledge from developed world programs may reduce postoperative infections as well as costs in LMIC programs.

**Global, regional, and national burden of rheumatic heart disease 1990–2015.** (*N Engl J Med*. 2017;377: 713-22).

This is an important paper that presents contemporary worldwide data on fatal and non-fatal rheumatic heart disease (RHD) for the period from 1990 through 2015. The authors estimated that there were 319,400 (95% uncertainty interval, 297,300 to 337,300) deaths due to rheumatic heart disease in 2015. Global age-standardized mortality due to rheumatic heart disease decreased by 47.8% from 1990 to 2015, but large differences were observed across regions. In 2015, the highest age-standardized mortality due to and prevalence of rheumatic heart disease were observed in Pacific islands (Oceania), South Asia (Indian subcontinent), and central sub-Saharan Africa. The prevalence of RHD was estimated at 33.4 million (95% uncertainty interval, 29.7 million to 43.1 million) cases. An additional important measure of disease burden that was estimated was the disability-adjusted life-years due to RHD. This was 10.5 million (95% uncertainty interval, 9.6 million to 11.5 million) globally.

The authors concluded that the estimated prevalence of and mortality due to RHD has declined globally over a 25-year period, but high rates of disease persist in some of the poorest regions in the world.

RHD has progressively slipped out of the collective consciousness of the global community of pediatricians, physicians and cardiologists. This is perhaps because it is largely confined to marginalized populations that have little access to health care. This marginalization has contributed to the perception that RHD is on a sharp decline. This perception among the medical community impacts policy makers. The Global Burden of Disease (GBD) data are particularly important for neglected diseases such as RHD that receive little attention from health policy makers and governments because of erroneous perceptions on disease prevalence and because of limited advocacy.

Global advocacy may have a greater impact on policy. At least for India, if a credible international agency were to publically report our national data, this is likely to translate into some action.

Advocacy can accomplish the following objectives with RHD control:

- Policies on penicillin manufacture, distribution and administration given the huge problems that exist globally with penicillin availability
- Delivering comprehensive cardiac care for the marginalized
- Planning large-scale heart surgeries and balloon mitral valvotomy through public health insurance
- Low-cost solutions for tertiary cardiac care

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