Cardiology in the Young

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Cardiac surgery for children in war and disaster zones: global experiences and lessons

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Review

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Abstract

Introduction: The 2025 Global Peace Index highlights that there are now 59 active state-based conflicts, the highest number since the Second World War, and overall levels of peacefulness are at their lowest since the index began. For children with CHD, this escalation means that more regions face disruption of surgical services, growing backlogs of untreated cases, and greater risks of displacement and loss to follow-up. *Methods:* We aimed to conduct a narrative review mapping existing evidence on the provision, models, outcomes, barriers, and enablers of paediatric cardiac surgery in conflict-affected and disaster settings while identifying gaps to inform future research and practice. *Results:* Conflicts and disasters amplify the burden of both congenital and acquired paediatric heart disease, worsened by late presentation and progressive loss of operability. The collapse of hospital infrastructure, targeting of health workers, interruption of supply chains, and diversion of resources to trauma care severely limit the feasibility of surgery. Perioperative challenges, including the absence of paediatric intensive care, infection control difficulties, and disrupted follow-up, frequently compromise outcomes. *Conclusion:* Conflict and disaster settings significantly exacerbate existing structural weaknesses in congenital cardiac care and may introduce additional system shocks that disrupt infrastructure, workforce stability, supply chains, and continuity of care. Future humanitarian health frameworks should explicitly include congenital and paediatric cardiac care within non-communicable disease response, supported by pre-positioned critical equipment, telemedicine, and long-term partnerships.

Introduction

Paediatric cardiac surgery encompasses operative management of CHD in children, as well as acquired conditions such as rheumatic heart disease and infective endocarditis.[1] In conflict and disaster zones, the need for paediatric cardiac surgery remains constant, but access to timely diagnosis and surgery is severely disrupted.[2] Infants with critical duct-dependent lesions often die before reaching specialist care and are therefore underreported, while older children present later with advanced and more complex pathology.[3] The overall burden of disease is further heightened by a rising prevalence of acquired cardiac conditions, e.g., rheumatic heart disease resurges where primary prevention and antibiotics are disrupted.[4] Infective endocarditis and tuberculous or bacterial pericarditis increase in overcrowded and low-resource settings.[5] Conflict-related trauma may also cause cardiac injuries in older children and adolescents, adding to the caseload.[6]

A major barrier to providing quality CHD surgical care is the shortage and maldistribution of the congenital surgical workforce,[7] who represent the standard of care for these operations. During conflicts, trained personnel may be displaced, hospitals repurposed for trauma care, and supply chains for specialist equipment interrupted, significantly inflating the cost of surgery. A single missing component, such as an unavailable oxygenator or pacing box, can render entire programmes non-functional.[8] While the challenges of congenital cardiac surgery in low-resource settings are well described, far less attention has been paid to how war and natural disasters acutely destabilise even partially functioning systems, converting chronic system fragility into sudden collapse. Therefore, this narrative review aims to explore existing evidence of models used in conflict and disaster settings, outcomes and barriers to providing congenital cardiac surgery, and how conflict and disaster settings uniquely compound pre-existing structural challenges in CHD care delivery.

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