

Child Mortality in the United States: Bridging Palliative Care and Public Health Perspectives

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Child and adolescent mortality rates in the United States have fallen fairly consistently since the 1960s.¹ And yet, infant mortality and deaths in adolescents and young adults are not infrequent. In 2015, 1 out of every 270 infants in the United States died before their first birthday, while 1 out of every 1438 Americans aged 15 to 24 died.² Among children and adolescents, nonintentional injuries, suicide, and homicide are leading causes of death (Table 1). These cause-of-death statistics provide powerful data to inform public health initiatives, preventive medicine programs, and child health advocacy around end-of-life care.

In this issue of *Pediatrics*, Trowbridge et al³ take the novel approach of studying modes of death rather than causes of death. Following chart review of all deaths at a freestanding children's hospital from 2011 to 2014, they created the following 5 mutually exclusive categories: (1) withdrawal of life-sustaining technology, (2) nonescalation of care, (3) failed resuscitation, (4) code then withdrawal, and (5) death by neurologic criteria. Consistent with national mortality statistics, >60% of children who died were infants. Mode of death was strongly associated with hospital location; almost three-quarters of children died in an ICU, and almost all withdrawal-of-care deaths occurred in these settings. In contrast, code deaths occurred predominantly in the emergency department (ED), and 100% of ED deaths occurred after failed resuscitation efforts. Aligning

with existing research focused on causes of mortality, Trowbridge et al³ observed racial disparities in mode of death, with African American individuals significantly more likely to die after a failed resuscitation attempt. Whereas only 16.1% of white children died after a code, 43.8% of African American children died in this way.

Conceptualizing these findings from a public health perspective raises a number of important questions about how causes of death are associated with end-of-life care in hospitals. Traumatic deaths from injuries are disproportionately experienced by African American children and adolescents and frequently occur in EDs and ICUs.^{2,4,5} Understanding whether racial disparities in modes of death are driven by differential causes of death or by differential end-of-life care, conditional on cause of death, is an important area of future inquiry. A natural extension of Trowbridge's et al³ single-center work is to examine variation in modes of child death across hospitals, including both children's hospitals and general hospitals. Substantial variation in modes of death across hospitals, adjusting for patient characteristics and cause of death, could reflect regional differences in families' preferences but could also suggest uncertainty about end-of-life decision-making by health care providers and opportunities for education regarding palliative care and family engagement in end-of-life care.

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TABLE 1 2015 Child and Adolescent Mortality in the United States, Both Overall and Due to Unintentional Injuries, Suicide, and Homicide (Grouped Together as Injuries)

Age, y	Mortality per 100 000 Population				Mortality From Injuries per 100 000 Population			
	All	Hispanic	Non-Hispanic White	Non-Hispanic African American	All	Hispanic	Non-Hispanic White	Non-Hispanic African American
<1	589.6	469.2	494.6	1123.1	39.1	22.2	36.1	81.6
1–4	24.9	19.8	22.9	41.6	10.1	7.9	9.4	17.4
5–14	13.2	10.5	12.9	19.2	5.4	4.0	5.4	8.0
15–24	69.5	56.2	67.5	104.5	51.9	41.9	50.7	77.1

Data were presented for the 3 largest racial and ethnic groups in the United States; data were generated from the Centers for Disease Control WONDER Online Database.²

To this point, Trowbridge et al³ examined rates of pediatric palliative care (PPC) consultation in their population and found that PPC was received by less than one-third of children who died, with considerable variation across hospital settings. Rates of consultation were relatively high for deaths on oncology and non-ICU wards, but PPC consultation was received by <30% of children who died in operating room settings and the NICU. None of the children who died in the ED received a palliative care consult, although 9.2% of all hospital deaths occurred there. Standard of care for palliative care provision is at the time of diagnosis of a serious illness instead of when death is imminent. As Trowbridge et al³ demonstrated, children with malignancies and complex chronic conditions were most likely to receive PPC consultation. In addition, there is growing recognition that palliative care can be valuable in ED and operating room settings.^{6–9} Studies of adults with chronic conditions have revealed the feasibility, acceptability, and benefits of palliative care consultation in these settings. Analogous studies in pediatrics may be used to identify key areas for quality improvement. Extending PPC consultation to those with acute, fatal injuries to provide bereavement support for families may serve as a valuable resource during the extraordinarily difficult period of acute loss and the grief that follows.

Mortality rates among children and adolescents in the United States remain significantly higher than in 19 peer nations in the Organization for Economic Cooperation and Development.¹ In adolescents and young adults, mortality from injuries remains exceedingly high, with disturbing racial disparities.¹ Addressing the root causes of these disparities, including poverty and social insecurity, may have substantial impacts on modes of in-hospital deaths among children. Bridging our knowledge about the epidemiology of child death in the United States with palliative care's emphasis on improving end-of-life care creates opportunities to better meet the needs of children, adolescents, and young adults dying in this country.

ABBREVIATIONS

ED: emergency department
PPC: pediatric palliative care

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