

Children, Youth, and the Life Course: IOM/NAM Contributions and Critical Areas for the Future

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This commentary is part of a series reviewing major impacts of the Institute of Medicine/National Academy of Medicine on the occasion of the 50th anniversary of its founding in 1970. Additional articles in this series can be found in the *New England Journal of Medicine* at <https://www.nejm.org/nam-health-progress>.

The recent 50th anniversary (2020) of the National Academy of Medicine (NAM) offered an opportunity to reflect on the breadth of studies that have addressed ways to enhance the health and well-being of children, youth, and families and, by extension, the health of all Americans. Numerous committees, workshops, and reports of the Institute of Medicine (IOM)/NAM and the National Academies of Sciences, Engineering, and Medicine (NASEM) have addressed these questions (see *Table 1 on page 3*). Increasingly, NASEM has broadened its commitment to family-centered health, including family and community voices in recommendations for change. This commitment and inclusion of community-based participatory research have strengthened the evidence base for all studies and improved equity. This perspective reviews major IOM/NAM/NASEM studies and considers critical areas for the future, including research needed to ensure continued improvements in the health and well-being of children, youth, and families. We focus on two broad themes and their impact on health and health care: (1) child/adolescent development and the life course and (2) prevention.

Child and Adolescent Development and the Life Course

NASEM has promoted the development and application of a life course approach to understanding health—namely, that positive and negative environmental influences accumulate and shape the health, well-being, and functioning of individuals and populations throughout life, with good evidence that early life experiences influence health well into adulthood and old age. Early life experiences influence adult chronic physical and mental health and disease. The

life course approach also documents how multiple sectors influence early development, the impact of adversity (including poverty and racism), and special issues related to adolescence, including impacts on brain maturation during these periods.

One landmark IOM report published in 2000, *From Neurons to Neighborhoods*, documented how early childhood experiences affect brain structure, growth, development, health, and well-being into adulthood (IOM and NRC, 2000). More recent studies describe changes in neuroendocrine function, epigenetics, and inflammatory response. In particular, these findings underscore the growing problem of premature mortality among U.S. working-age adults. Temporal increases in mortality rates among working-age adults in the United States contrast with adult mortality rates in essentially all other industrialized nations, where rates have fallen (NASEM, 2021). U.S. rates begin to rise during the third decade of life, and early childhood adversity contributes substantially to morbidity, mortality, and socioeconomic challenges during adulthood. Insofar as many adult chronic physical and mental health conditions have their origins in childhood, improving life expectancy requires prevention and early intervention. We call for more research that directly addresses how expanding policy and programmatic interventions directed to children and adolescents translate into better health for working-age adults.

The 2004 IOM report *Children's Health, The Nation's Wealth* emphasized the influence of multiple sectors on child and adolescent health and well-being and expanded definitions of child health outcomes to include developmental characteristics (health status, functioning, and health potential) (NRC and IOM, 2004). Evidence that lifelong

influences extend beyond the health sector has informed research and strategies for intervention, such as changes in early education including preschool programs, focused attention on early identification and mitigation of adversity and enhancement of parenting skills, and encouraged partnership across societal sectors.

NASEM work also highlights the impact of mental and behavioral health on young people, acknowledging that adult mental health conditions often begin in childhood. Between 1994 and 2019, the IOM and NASEM published three influential reports on child and adolescent mental and behavioral health, which documented high rates of behavioral and mental health problems, the availability (but too limited use) of effective treatments, and opportunities for prevention (IOM 1994; IOM and NRC 2009; NASEM 2019). Efforts to scale prevention programs at community and broader levels remain a challenge. The most recent report focused on the efficacy of prevention strategies and the role of neighborhoods, culture, discrimination, and income inequality on mental and behavioral health. Persistent gaps remain in the organization and financing of mental and behavioral health promotion, risk prevention, and provider training.

For decades, U.S. children have experienced much higher rates of poverty than children in most other industrialized countries, as well as older U.S. populations. A 2019 NASEM report reviewed the impact of public programs on child poverty and recommended major changes in support for families raising children, including expanding tax credits and proposing a universal child allowance, and some changes have gained public support (Perrin et al., 2020). During the COVID-19 pandemic, the Child Tax Credit, as part of the American Rescue Plan, substantially lowered poverty rates among children and youth (Maag, 2022). Further studies should document effects on health and development.

Several NASEM reports address opportunities to improve adolescent health and well-being, describe the plasticity of brain structure and function in adolescence, and suggest how health, communities, schools, and family interact to improve adolescent growth and development (Perrin et al., 2020). The work also highlights promising and proven interventions that could be brought to scale to improve health and developmental outcomes.

The National Children's Study at the National Institutes of Health (NIH) was designed to recruit 100,000 children from birth to age 21 to understand antecedents of health and illness across the life course. Two NASEM reports focused on strengthening the study methodology, but the NIH terminated this important study. While the NIH Environmental Influences on Child Health Outcomes program focuses

on more limited cohort studies, the nation's largest cohort study, the *All of Us* Research Program, does not currently recruit participants under age 18, a missed opportunity to study early influences on health and disease.

Taken as a collective body of work, these studies frame research and policy perspectives that should guide future work toward better life outcomes, lower mortality, and a safer and more productive society.

Prevention

Prevention of morbidity and mortality is at the heart of child and adolescent health. We highlight three areas in which IOM/NAM/NASEM reports have been influential yet still need attention and funding: health care coverage, vaccines, and injury.

America's Children: Health Insurance and Access to Care (1998) was the first report that aggregated evidence of the strong association between health insurance coverage for children and youth and positive health outcomes. Partly as a response to this report, children's health insurance coverage expanded through broader Medicaid eligibility and coverage as well as the introduction of the Children's Health Insurance Program (CHIP), which covers lower-income children who are ineligible for Medicaid but lack access to employer-sponsored insurance. These policy efforts have successfully lowered uninsurance rates among children and youth in the United States. Although critically important programs, Medicaid and CHIP disproportionately cover children of color, offering substandard payment rates and limiting some access to care, thus perpetuating elements of racial injustice.

Vaccines are among the most effective interventions to improve health by reducing rates and impact of infectious diseases. Despite extensive data supporting vaccine safety and efficacy, various groups have raised concerns about vaccines and promoted resistance to them, most recently to COVID-19 vaccines. A now debunked and retracted 1998 *Lancet* paper suggested an unproven link between the MMR vaccine and autism, leading parents and others to raise concerns that measles vaccination led to increases in autism. Several important IOM studies and workshops reviewed a vast body of evidence that confirmed the safety and efficacy of measles and other vaccines and highlighted the serious public health threat of vaccine hesitancy, a message of continuing importance (IOM, 2004). The persistence of unfounded concerns calls for a focus on reducing vaccine misinformation and promoting vaccine uptake, especially among children and adolescents.

In the United States, injury is the leading cause of death among individuals 1 to 44 years old. The IOM published two groundbreaking reports on this topic. The first report,

Injury in America, was published in 1985, followed a decade later by *Reducing the Burden of Injury* (1995), which highlighted opportunities for childhood injury prevention and documented significant progress in reducing injuries associated with car seats and seatbelts. Additional reports on bullying, child abuse, suicide, and violence have also shaped prevention strategies.

Present and Future

The COVID-19 pandemic has highlighted global inequities in health and health care. The 2019 NASEM report *Vibrant and Healthy Kids* clarified sources of inequity in health systems and provided a vision of child and adolescent health care that addresses early adversity, diminishes inequities,

improves community integration, lowers adult mortality, and improves long-term well-being and productivity (Perrin et al., 2020). The pandemic also confirmed how inequities in exposure to many toxic and adverse community factors contribute to poor health. It is imperative to address the critical health issues facing children, adolescents, and families as a strategy to improve individual and population health throughout the life course. In light of the significant impact of the COVID-19 pandemic on the mental and physical health of children, current NASEM studies address the pediatric workforce and the long-term impact of the pandemic on children and families (NASEM, n.d.a.; n.d.b.). New studies should address the continuing increase of chronic illness among children, including mental health conditions, the impact of technology on health, and climate change.

TABLE 1 | Influential National Academy of Medicine/Institute of Medicine Reports on Child and Adolescent Health

Area of Focus	Report Title (Year)
Access to Care	<ul style="list-style-type: none"> America’s Children: Health Insurance and Access to Care (1998) Children’s Health, the Nation’s Wealth: Assessing and Improving Child Health (2004)
Adolescent and Young Adult Health	<ul style="list-style-type: none"> Promoting Positive Adolescent Health Behaviors and Outcomes: Thriving in the 21st Century (2020) The Promise of Adolescence: Realizing Opportunity for All Youth (2019) Investing in the Health and Wellbeing of Young Adults (2015) Adolescent Health Services: Missing Opportunities (2009) Adolescent Risk and Vulnerability: Concepts and Measurement (2001)
Cancer	<ul style="list-style-type: none"> Childhood Cancer and Functional Impacts across the Care Continuum (2020) Childhood Cancer Survivorship: Improving Care and Quality of Life (2003)
Early Childhood	<ul style="list-style-type: none"> Transforming the Workforce for Children Birth Through Age 8: A Unifying Foundation (2015) Depression in Parents, Parenting, and Children: Opportunities to Improve Identification, Treatment, and Prevention (2009) From Neurons to Neighborhoods: The Science of Early Child Development (2000)
Health Disparities	<ul style="list-style-type: none"> Vibrant and Healthy Kids: Aligning Science, Practice, and Policy to Advance Health Equity (2019) A Roadmap to Reducing Child Poverty (2019) The Health of Lesbian, Gay, Bisexual, and Transgender People: Building a Foundation for Better Understanding (2011)
Immunizations	<ul style="list-style-type: none"> The Childhood Immunization Schedule and Safety: Stakeholder Concerns, Scientific Evidence, and Future Studies (2013) Immunization Safety Review: Vaccines and Autism (2004)
Injury Prevention	<ul style="list-style-type: none"> Preventing Bullying Through Science, Policy, and Practice (2016) New Directions in Child Abuse and Neglect Research (2014) Reducing the Burden of Injury: Advancing Prevention and Treatment (1995) Injury in America: A Continuing Public Health Problem (1985)
Mental/Behavioral Health	<ul style="list-style-type: none"> Fostering Healthy Mental, Emotional, and Behavioral Development in Children and Youth: A National Agenda (2019) Preventing Mental, Emotional, and Behavioral Disorders among Young People: Progress and Possibilities (2009) Reducing Risks for Mental Disorders: Frontiers for Preventive Intervention Research (1994)
National Children’s Study	<ul style="list-style-type: none"> The National Children’s Study: An Assessment (2014)
Obesity Prevention	<ul style="list-style-type: none"> Local Government Actions to Prevent Childhood Obesity (2009) Preventing Childhood Obesity: Health in the Balance (2005)

SOURCE: Created by authors. All studies available at nap.edu.

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