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The Transformation Of Child Health In The United States

Social disparities in child health persist despite dramatic improvements in child health overall.

by **Paul H. Wise**

PROLOGUE: The health of children in the United States poses a paradox. Mortality rates have declined dramatically. Health insurance coverage has improved. Insuring the nation's children has been the focus of much policy activity ever since President Clinton's failed effort to provide universal health coverage. The notion was, if we can't cover everyone, let's at least cover the children. And on the current presidential campaign trail, insuring the children (for eight million or so are still uninsured) has been a popular political topic. Yet as author Paul Wise explores the state of child health today in a sweeping epidemiological "check-up," he finds that because of social trends and medical progress over the past three decades, the threats to children's health have changed so dramatically that many of our current health policies and systems of delivery have been rendered obsolete. Here, Wise proposes a new way of thinking about children's health in this country that could drive policy in important ways. He calls for more focused attention on the role of chronic illness in childhood, on the impact of social determinants in health, and on the striking prevalence of disparities. Policy action is needed to address reforms both in clinical care and in the public health aspects that ultimately drive the health of our children.

When he wrote this paper, Wise was vice chief of the Division of Social Medicine and Health Inequalities in the Department of Medicine, Brigham and Women's Hospital, in Boston, Massachusetts. He also served as visiting professor of medicine at Harvard Medical School; professor of pediatrics in the Boston University School of Medicine and the Department of Pediatrics at Boston Medical Center; and associate in medicine at the Children's Hospital, Boston. He is now professor of pediatrics at Stanford University's School of Medicine (pwise@healthpolicy.stanford.edu) and Centers for Health Policy and Primary Care Outcomes Research. Wise received his undergraduate and medical degrees from Cornell University and a master of public health degree from the Harvard School of Public Health. He has served as a special expert at the National Institutes of Health (NIH) and a special assistant to the U.S. Surgeon General. He chairs the Steering Committee of the NIH Global Network for Women's and Children's Health Research. Wise focuses his research on social inequalities in child health and child health policy.

ABSTRACT: Social trends and medical progress have fueled major changes in the epidemiology of child health in the United States. Injuries remain a major contributor to childhood illness and death. However, among noninjury causes, chronic illness now accounts for the majority of children's hospital days and deaths. Although mortality rates for all children have fallen dramatically, social disparities persist. Approximately half of all excess deaths among African American children occur during infancy, primarily from extremely premature births, and the remaining portion, primarily from homicide and serious chronic conditions. These challenges may require changes in today's child health practices and policies.

CHILD HEALTH, ILLNESS, AND DEATH have always reflected how children live. Trends in the material well-being of families, larger currents in mass culture, and the social role of childhood all help shape the daily exposures and safeguards of childhood. These, in turn, are ultimately expressed as patterns of morbidity and mortality. However, technical advances, such as sanitation systems and health care, also play major roles in shaping patterns of child health. Together these social and technical influences make child health highly dynamic, particularly during periods of rapid social and technologic change.¹

This paper raises the question: Can today's child health policies and care delivery systems adequately address this dynamic epidemiology? I ground the exploration of this question in an examination of recent trends in U.S. child illness and mortality. Although this is broad by necessity, the intention is to encourage a more purposeful public deliberation of how current and emerging threats to child health can best be addressed by a health care system that is in the midst of unprecedented innovation in clinical capacity.

Social Determinants Of Child Health

Patterns of child health are always rooted in patterns of social well-being. Trends in the material well-being of the American family, which remains the primary conduit through which societal resources flow to children, have always been of particular importance.

■ **Poverty.** Poverty has never been as deeply concentrated in childhood as it is now. Since the 1980s children have been the poorest age group in U.S. society. In 2002 approximately 17 percent of all children and 18.5 percent under age six lived in families with incomes below 100 percent of the federal poverty level (\$14,348 for a family of three in 2002).² Almost half of all children living in poverty are considered to be "severely poor," with family incomes below 50 percent of the poverty threshold. However, family poverty is highly dynamic. Data from a 1996–1999 Census Bureau survey suggest that more than a third of U.S. families experienced poverty for at least two consecutive months during the four-year survey period.³ In 2002 more than four million children lived in families that hovered just above poverty. In addition, other social characteristics affect families' well-being (Exhibit 1).

■ **Economic inequality.** Inequalities in income and wealth among U.S. households also show worrisome trends. Between 1982 and 1998 the top 1 percent of

EXHIBIT 1
Change In Selected U.S. Social Characteristics, 1980 And 2001

	1980	2001	Percent change
Percent in two-parent household ^a	77.0%	69.0%	-10.4
Percent in mother-only household ^a	19.1%	23.0%	20.4
Birth rate for unmarried women ^b	29.4	43.8	49.0
Percent of all births to unmarried women ^b	18.4%	33.5%	82.1
Percent of children under 18 living in poverty ^c	18.0%	16.0%	-11.1
Percent of children under 18 living in extreme poverty ^c	7.0	7.0%	0.0
Gini coefficient ^d	0.40	0.47	16.5
Percent with housing problems ^e	31.0%	36.0%	16.1
Percent with food insecurity ^f	- ^g	17.6%	- ^g
Percent of 12th graders smoking cigarettes ^h	21.3%	19.0%	-10.8
Percent of 12th graders using alcohol ⁱ	41.2%	28.6%	-30.6
Percent of 12th graders engaging in illicit drug use ^j	37.2%	25.7%	-30.9
Percent of adolescents who were victims of violent crime ^k	37.6%	16.3% ^l	-56.6

SOURCES: See below.

^a Source: U.S. Census Bureau, Current Population Survey.

^b Rate per 1,000 unmarried women ages 15–44. Source: Table POP7-A, “America’s Children 2003,” www.childstats.gov/ac2003/tbl.asp?id=1&iid=104.

^c Extreme poverty is income below 50 percent of poverty threshold. Source: U.S. Census Bureau, Current Population Survey.

^d Measure of income inequality: the higher the coefficient, the greater the inequality. See Note 5 in text.

^e Cost greater than 30 percent of income or inadequate or crowded housing. Source: U.S. Census Bureau and U.S. Department of Housing and Urban Development, Annual Housing Survey and American Housing Survey.

^f Source: U.S. Census Bureau, Food Security Supplement to the Current Population Survey.

^g Data not available; percent change not applicable.

^h Percent of 12th graders who report cigarette use daily in the previous 30 days. Source: I.D. Johnson, P.M. O’Malley, and J.G. Bachman, *Monitoring the Future: National Survey Results on Drug Use, 1975–2000*, Vol. 1, NIH Pub. no. 01-4924 (Bethesda, Md.: National Institute on Drug Abuse, 2001), Tables D-48 and D-49. Data for 2001 from “America’s Children 2002,” www.childstats.gov/ac2002/tbl.asp?id=5&iid=1.

ⁱ Percent of 12th graders who report drinking more than 5 drinks in a row in the past 2 weeks. Source: Johnson et al., *Monitoring the Future, 1975–2001*, NIH Pub. no. 02-5106 (Bethesda, Md.: NIDA, 2002).

^j Percent of 12th graders who report having used marijuana, cocaine, heroin, hallucinogens, and nonprescription amphetamines or psychotherapeutics in the previous 30 days. Source: Johnston et al., *Monitoring the Future*.

^k Ages 12–17. Source: U.S. Department of Justice, Bureau of Justice Statistics, National Crime Victimization Survey, as cited in “America’s Children 2002,” www.childstats.gov/ac2002.

^l Data from 2000.

households saw their average wealth (adjusted to reflect 1998 dollars) rise 42 percent. However, during the same period the poorest 40 percent of U.S. households lost an average of 76 percent of their wealth.⁴ The Gini coefficient, a measure of the relative distribution of incomes in a population, has also grown increasingly more unequal over the past two decades.⁵ Although absolute deprivation has long been associated with a variety of adverse child health outcomes, including low birth-weight, infant mortality, and child morbidity and mortality, inequality may itself be associated with poor outcomes. Job loss and reductions in employment-based health and other benefit programs have also contributed to an apparent rise in families’ insecurity.⁶ In addition, housing costs and child hunger remain major challenges for many U.S. households.⁷

Technical Determinants Of Child Health

■ **Technical innovation and access.** In a setting of social stratification, the purpose of health care is to uncouple disadvantage from its implications for health. The intent is to use technical means to create equity in positive health outcomes in the face of persistent inequalities in social status. When interventions are highly efficacious, then differences in the use of these interventions will dominate patterns of health outcomes; when interventions are of low efficacy, then differences in underlying risk, including those that are social in origin, will dominate patterns of outcome.

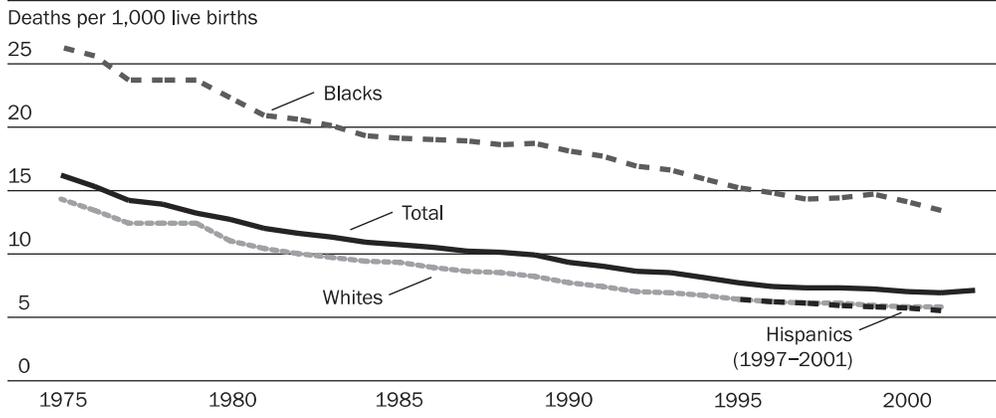
This logic implies that as clinical capacity grows, so too does the burden on society to provide it to all children in need. Access to care becomes more important as the efficacy of what health care has to offer expands. Therefore, during a period of dramatic medical progress, the impact of not having insurance—the primary determinant of access in the United States—can only grow. It is in this context that the recent efforts to address the lack of universal insurance coverage for U.S. children must be viewed.

Medicaid remains the single most important public mechanism for ensuring that poor children have health insurance. However, more than 8.5 million children lacked insurance in 2002.⁸ Expansion of Medicaid eligibility and enrollment efforts and the launching of the State Children's Health Insurance Program (SCHIP) for poor and near-poor children not eligible for Medicaid have helped provide better coverage during the past several years. Nevertheless, improvements in insurance coverage have been extremely slow to happen: Approximately one in eight U.S. children remain uninsured, and one in five U.S. Hispanic children are uninsured.⁹ The lack of insurance, particularly in the face of poverty, can have a dramatic impact on access to important health care services for children.¹⁰

■ **The legacy of birth: trends in infant outcomes.** Patterns of birth outcomes ripple across the full epidemiology of child health. Death in the first year of life now accounts for almost 60 percent of all deaths in childhood, from birth through age eighteen.¹¹ Indeed, almost 40 percent of all childhood deaths occur in the first twenty-eight days of life. In addition, death associated with premature birth, low birthweight, congenital anomalies, and a spectrum of specific genetic disorders identified in the first year of life is becoming increasingly important in determining health care needs and spending. Therefore, any assessment of child health must first examine the legacy of birth.

Impact of prematurity. Infant mortality for all groups has fallen dramatically during the past three decades (Exhibit 2). The primary reason for the declines in infant mortality in the United States has been the marked improvements in the survival of premature, very-low-birthweight newborns, largely due to advances in high-risk obstetrics and neonatal intensive care.¹² What has not improved, however, is the rate at which these high-risk infants are born. Indeed, the notoriously poor international ranking of U.S. infant mortality rates among other industrialized countries (twenty-eighth in 1999) is largely due to the relatively high birth

EXHIBIT 2
U.S. Infant Mortality Rates, By Racial/Ethnic Group, 1975–2002



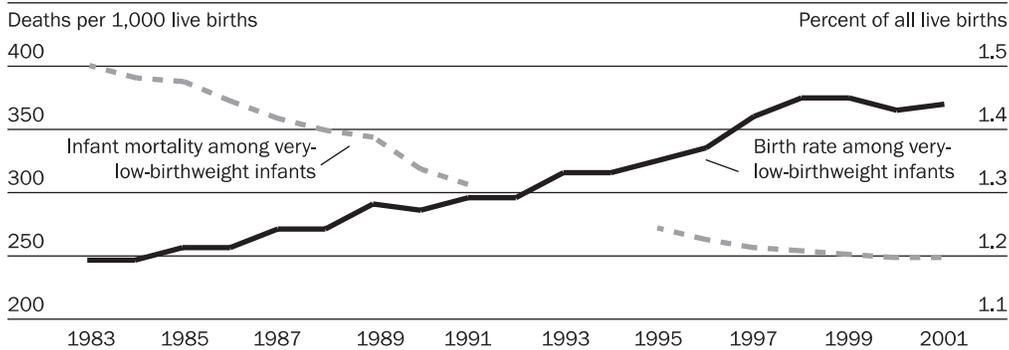
SOURCE: National Center for Health Statistics, National Vital Statistics System, www.cdc.gov/nchs/nvss.htm.

rate of premature infants in the United States.¹³ Even though very-low-birthweight infants (less than 1,500 grams) represent less than 2 percent of all U.S. births, they account for 68 percent of all U.S. neonatal deaths (Exhibit 3).

The falling rates of mortality among premature infants have been coupled with the recognition that many of the survivors have an elevated risk of serious medical and developmental effects.¹⁴ However, there is strong evidence that this risk has fallen concomitantly with the declines in mortality. Although comprehensive national data are not available, estimates suggest that morbidity has fallen with mortality, but with some temporal lag.¹⁵ Therefore, it appears that the numbers of surviving premature newborns with major problems has indeed risen.

Disparities in infant outcomes. Although neonatal mortality rates have greatly im-

EXHIBIT 3
U.S. Birth And Mortality Rates Among Very-Low-Birthweight Infants, 1983–2001



SOURCE: National Center for Health Statistics, National Vital Statistics System, www.cdc.gov/nchs/nvss.htm.

NOTES: Dashed line relates to the left y axis and denotes deaths per 1,000 live births among very-low-birthweight infants. Solid line relates to the right y axis and denotes the percentage of live births that were very-low-birthweight infants. Data on infant mortality were unavailable for 1992–1994.

proved during the past three decades, the rate for black newborns remains more than twice the rate for whites. (Trend data for Hispanic populations are not available.) Great caution should be exercised when assessing the impact of race on health outcomes, as its complex social character is often diminished in medical analyses of disparate outcomes.¹⁶ Generally, the risk of survival for very-low-birthweight black infants is at least as good as that for whites, as long as there are no differences in access to obstetrical and neonatal intensive care. The difference in neonatal mortality, therefore, is almost entirely attributable to the highly elevated rate of very-low-birthweight infants born to black women, an outcome heavily associated with poverty (Exhibit 4).¹⁷ The differences in the birth rate of newborns weighing less than 500 grams accounted for more than 45 percent of the overall neonatal mortality disparity; the birth-rate difference for all newborns weighing less than 1,500 grams accounted for almost 80 percent of the racial disparity. Although the risk for premature birth has been long associated with income, education, and a variety of other social influences, the precise pathophysiologic mechanisms of extreme prematurity likely involve a heterogeneous spectrum of clinical pathways. These, in turn, appear to reflect complex genetic and environmental interactions, many of which appear to be rooted in events occurring before pregnancy and during its early stages.

Trends In Child Health Outcomes

■ **Acute illness.** There has been little change in the incidence of acute illness among U.S. children. Data from the National Health Interview Survey (NHIS), a cross-sectional annual survey of approximately 40,000 households containing some 30,000–40,000 children, were used to track trends in acute illnesses over the past four decades.¹⁸ The NHIS defines *acute illness* as any disease or injury that requires an activity restriction or medical attention for less than three months. Overall, there was only a modest reduction in acute illness among children, as the average annual

EXHIBIT 4
Contribution Of Birthweight Categories To All Black Births And To The Disparity Between Black And White Neonatal Mortality Rates, 2000

Birthweight (grams)	Percent of all black births	Percent of black/white neonatal mortality disparity
Under 500	0.43	45.36
500–749	0.71	33.31
750–999	0.66	6.68
1,000–1,249	0.67	2.93
1,250–1,499	0.72	1.73
1,500–1,999	2.56	3.35
2,000–2,499	7.39	3.16
2,500 or more	86.79	3.48

SOURCE: National Center for Health Statistics, National Vital Statistics System, www.cdc.gov/nchs/nvss.htm.

rate fell from 3 to 2.4. This modest overall reduction was attributable almost entirely to declines among school-age children and adolescents (Exhibit 5), while the rate for young children remained remarkably stable.

Although acute illnesses among school-age children fell only modestly, the number of days children were in bed because of illness fell 41 percent between 1962 and 2000 (Exhibit 5). This dramatic decline was associated with a concomitant fall in days absent from school. Although the reasons for this elasticity between illness and its impact on bed disability and school absence cannot be ascertained from this data source, it likely reflects major trends in maternal employment and the widespread use of effective medications to control fever.

Chronic illness. Strong evidence exists of an increase in the prevalence of chronic childhood illness during the past several decades.¹⁹ Although differing definitions make comparisons over time quite difficult, NHIS data suggest that approximately 15 percent of all children have a chronic condition, with approximately a third of these considered moderate or severe.²⁰ Not surprisingly, children with a chronic illness have dramatically greater health care needs than their well peers, with three times the average number of physician contacts and hospitalizations and an eightfold difference in days of hospitalization.

The reasons for the apparent increase in childhood chronic illness have been difficult to ascertain. Some of the increase is likely the result of changes in survey procedures, improvements in diagnosis, and a greatly expanded public awareness of behavioral and developmental disorders.²¹ Nevertheless, there is strong evidence for the increased prevalence of certain important chronic child health conditions. For example, asthma rates in children have risen from 3.7 percent in 1980 to 12.7 percent in 2000; and obesity rates, from 5.7 percent in 1980 to 15.3 percent in 2000.²² This trend has been observed worldwide and has been related to a vari-

EXHIBIT 5
Trends In Acute Conditions, Bed Disability Days, And Hospitalization Among Children Ages 5–17, Selected Years 1962–2000

	Acute conditions ^a	Bed disability ^b	Hospitalization ^c
1962	2.8	5.6	72.3
1972	2.6	5.3	66.8
1982	2.44	4.12	71.6
1992	– ^d	3.68	43.1
2000	2.2	3.3	39.4
Percent change, 1962–2000	–21.43%	–41.07%	–45.50%

SOURCES: Authors' analyses of data sources below.

^a Disease or injury that requires an activity restriction or medical attention of less than three months' duration (per child over the past year). Source: National Health Interview Survey.

^b Person stayed in bed more than half a day because of illness or injury (per child over the past year). Source: National Health Interview Survey.

^c Discharges per 1,000 children over the past year. Source: National Hospital Discharge Survey.

^d Data not available.

ety of potential influences. Similarly, reported rates of serious developmental and behavioral disorders in young children, including a spectrum of autistic and attention deficit/hyperactivity disorders, may represent real increases in these rates and not just reporting artifacts associated with increased awareness and diagnostic capabilities.²³ In addition, the broader mental health needs of children have become more apparent in recent years.²⁴ Dramatic increases in childhood obesity have also received considerable recent attention. Although obesity does not usually result in the kinds of functional impact that underlie most definitions of major chronic illness, it can be associated with a variety of chronic problems such as Type II diabetes and asthma. The rise in the prevalence of chronic disorders can also be observed in patterns of bed disability days: In 1982 approximately 13 percent of all bed disability days in children were attributable to chronic conditions; the comparable figure for 2000 was approximately 25 percent.

■ **Severity of pediatric illness and hospitalization.** Even at a time when the capabilities of outpatient management are growing rapidly, hospitalization remains among the best general indicators of the severity of illness in children. Analysis of data from the National Hospital Discharge Survey (NHDS), an annual sampling of U.S. acute care hospitals, suggests significant reductions in hospitalization, with a 45 percent decline between 1962 and 2000 (Exhibit 5).²⁵ However, the precise cause of these reductions is undoubtedly heterogeneous, and incentives for outpatient treatment, including those associated with managed care, are likely to have played an important role. The length of hospital stay for children fell slightly over this time period as well.

To assess the relative contribution of acute and chronic illness to changing hospitalization patterns, the NHDS data were analyzed using a categorical, diagnosis-based definition for chronic illness based on NHIS criteria. Injuries accounted for approximately 9 percent of childhood admissions in 2000. Noninjury admissions were separated into acute and chronic hospitalizations. Chronic conditions were defined using the NHIS categorical system for conditions lasting at least three months. Although changes in diagnostic capacity and coding over more than four decades make detailed temporal comparisons somewhat problematic, the scale of the shift toward chronic diseases seems to have been profound. Among all medical admissions (excluding injury-related causes) for children younger than age seventeen, approximately a quarter were associated with a chronic diagnosis in 1962; by 2000 the figure had more than doubled to approximately 55 percent.

The precise reasons for this dramatic shift remain poorly defined. However, evidence suggests that hospitalization rates and lengths-of-stay for children with chronic illness have fallen more slowly than among children without a chronic disease.²⁶ In 1962 approximately 4 percent of hospital bed days for children were accounted for by children who had had two or more admissions that year; by 2000 this figure had risen to approximately 25 percent.

Acute infectious diseases remain an important cause for health service use and

spending (Exhibit 6). However, chronic illness, particularly asthma and mental disorders (which include developmental, learning, and psychiatric disorders), accounts for a large portion of child health spending. When spending for all causes is assessed, approximately 80 percent of all nontraumatic spending was attributable to chronic illness, a figure applicable to just 20 percent of all children.²⁷

■ **Trends in mortality.** U.S. mortality rates for children have fallen dramatically over the past several decades. This should be viewed as the most recent extension of a long-standing trend of declining mortality among all age groups in the United States (Exhibit 7). Of note has been the reduction in child mortality from acute infectious diseases.²⁸ Mortality from injuries remains the leading cause of death among children, although major reductions have been made in virtually all injury categories. Of the 13,555 total childhood deaths that occurred in 2001, some 6,646 were the result of unintentional injuries, by far the largest contributor.

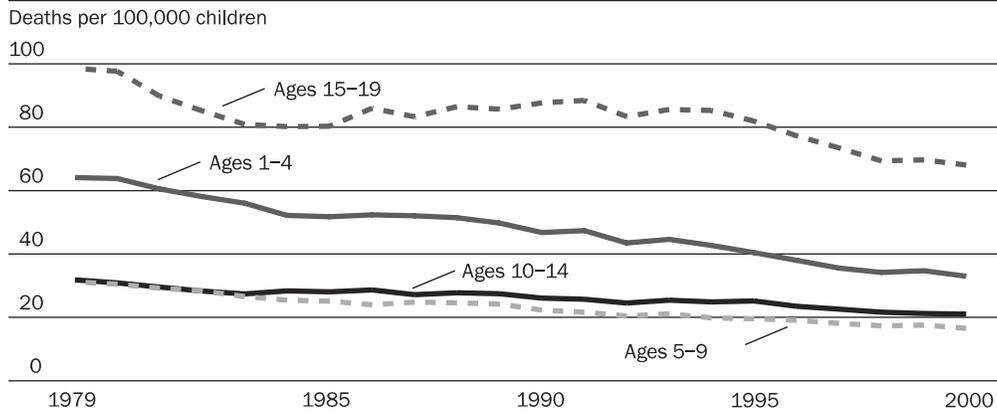
Chronic illness contributes strikingly to U.S. child mortality. Data from Washington State suggest that children with complex chronic conditions—a small subset of children with chronic conditions—account for more than half of all child-

EXHIBIT 6 Events And Expenditures For Selected Conditions Among Children Ages 1–18, 2002

Condition	Number of events (thousands)					Total
	Outpatient	Hospital inpatient	Emergency room	Prescribed medicines	Home health	
Asthma	20,248	227	1,085	24,664	500	46,724
Mental disorders	24,019	130	85	8,225	1,146	33,606
Trauma	13,164	223	4,462	3,328	12	22,158
Respiratory infection	20,249	239	833	17,085	–	38,426
Ear infection	15,495	76	854	12,652	49	29,127
Epilepsy and other CNS disorders	6,227	191	138	2,979	1,308	10,855
All other infections	11,206	268	1,020	8,940	184	24,913
Congenital anomalies	1,912	73	12	299	41	2,337
Diabetes and other endocrine, nutritional, and immune disorders	4,069	113	110	1,315	13	5,619
Cancer	506	18	–	620	–	581
Condition	Total expenditures (millions of dollars)					Total
	Outpatient	Hospital inpatient	Emergency room	Prescribed medicines	Home health	
Asthma	1,150.82	720.29	307.37	1,560.72	2,284.62	6,023.83
Mental disorders	1,605.07	571.63	12.51	1,307.89	1,686.03	5,183.13
Trauma	1,965.88	998.27	1,889.99	85.49	22.52	5,164.46
Respiratory infection	1,213.11	548.21	255.77	474.40	*	2,492.19
Ear infection	1,114.64	350.33	113.02	484.99	52.04	2,115.02
Epilepsy and other CNS disorders	730.20	523.26	155.69	291.27	2,358.13	3,940.66
All other infections	770.47	716.92	171.23	128.93	153.10	1,940.66
Congenital anomalies	301.40	594.90	3.58	14.83	95.69	1,010.39
Diabetes and other endocrine, nutritional, and immune disorders	671.51	284.81	84.28	520.90	2.92	1,564.41
Cancer	93.30	34.30	–	–	–	128.23

SOURCE: Tabulations from Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, Household Component.

NOTES: CNS is central nervous system. Empty cells indicate too few data to calculate a reliable national figure.

EXHIBIT 7**U.S. Mortality Rates In Children, By Age Group, 1979–2000**

SOURCE: National Center for Health Statistics, National Vital Statistics System, www.cdc.gov/nchs/nvss.htm.

hood deaths from medical causes, excluding the perinatal age group.²⁹ Other data suggest that approximately one-quarter of all medical pediatric deaths occur among children with two or more complex chronic conditions.³⁰ Analysis of the National Vital Statistics Death Files suggests that these trends have occurred nationally as well, with significant increases in the contribution of chronic disorders to noninjury mortality rates.³¹ In 2000 some 70 percent of noninjury deaths among children ages 1–4 and more than 80 percent of deaths among all school-age children were the result of chronic causes.

■ **Disparities in child mortality.** Child mortality is perhaps the starkest challenge to child health policies and practice. Mortality for both black and white children in the United States fell dramatically over the period 1981–2001. The only group that did not experience a reduction was African Americans ages 15–19, primarily because of a rise in homicide and suicide rates in this group.³²

Although rate ratios are useful for assessing relative differences in mortality between the two populations of children, it is also useful to calculate the actual number of excess deaths, a reflection of both relative differences between the compared groups and the absolute mortality occurring in the age or causal group under study. Here, this is the equivalent of simulating how many African American children would have been expected to die if they had had the same mortality rates as their white counterparts, with the “excess deaths” being the difference between the actual and the simulated number of expected deaths (Exhibit 8).

More than 85 percent of all homicide deaths among black children in 2001 were excess deaths. The comparable figure for the anemia group was attributable to sickle-cell disease, a genetic disorder with higher prevalence among blacks than among whites. Mortality rates from injuries and suicide were consistently higher for white children than for black children overall. However, substantial numbers of excess deaths attributable to injury were observed for black children under age

EXHIBIT 8
Excess African American Mortality For Children Ages 1–19, By Cause: United States, 1981 And 2001

Cause of mortality	1981 (%)	2001 (%)
Injury	-16.0 ^a	-1.7 ^a
Homicide	76.0	86.6
Infection	36.2	43.7
Congenital anomalies	13.5	36.6
Neoplasms	2.7	4.9
Suicide	-174.5 ^a	-85.4 ^a
Heart disease and cerebrovascular	46.7	53.0
Asthma	71.3	80.4
Anemias	81.2	84.3
Diabetes	48.4	67.2
Other	34.7	35.0
Total	18.9	32.4

SOURCE: Author's calculations based on data from the National Vital Statistics System, Mortality Files, National Center for Health Statistics.

NOTE: Excess deaths calculated by multiplying the age-specific white mortality rate by the African American age-specific population and subtracting this figure from the actual number of African American age-specific deaths; these excess deaths are then totaled for all the age groups.

^aNegative percent denotes actual deaths were less-than-expected deaths.

ten. Above age ten, motor vehicle occupant mortality—by far the leading cause of injury deaths in this group—was considerably higher among white children than among black children.

The largest increase in excess deaths occurred in the congenital anomaly group. Although the reasons for this are not easily identified using this data set alone, it may reflect differences in the use of prenatal diagnosis and abortion services or increased differences in survival among children with severe anomalies, or both. For all causes, approximately one in five African American childhood deaths were “excess” in 1981; the figure for 2001 approached one in three.

Homicide was the leading contributor to excess deaths among African American children in 2001, at 57 percent. Other contributors were heart and cerebrovascular conditions, 8 percent; congenital anomalies, 5 percent; infections and chronic respiratory conditions, 4 percent; anemias, 3 percent; and diabetes and neoplasms, 1 percent.³³

Implications For Practice And Policy

Virtually all causes of childhood illness and death represent the distal expression of a complex interaction of social and biologic forces. Regardless of the precise clinical pathophysiology, an array of potential societal and clinical interventions is likely to exist. This implies that the struggle to improve U.S. child health is likely to remain highly pluralistic, with clinical services serving not as an alternative but rather as an essential component of broader efforts for collective action

“The central focus for addressing the health care needs of all children rests with the provision of primary care.”

.....

and social reform.

■ **The comprehensive demands of injury reduction.** Efforts to reduce the catastrophic toll of injuries among American children have necessarily relied on a comprehensive approach.³⁴ The reduction of motor vehicle occupant, bicycle, pedestrian, fire, poisoning, and drowning injuries have all relied on a mix of legislative, educational, and community-based initiatives. Clinical interventions have also been important, and injury reduction has become an integral part of recommended well-child care. However, the actual implementation of these injury-reduction elements has proved to be difficult under current practice structures, as recent evidence continues to document major deficiencies in the provision of age-appropriate guidance to parents regarding child safety.³⁵

■ **Chronic illness and the dichotomization of primary care.** Hospitalization and death among children have increasingly been associated with chronic illness. At the same time, well children have a far smaller risk of experiencing a serious acute illness than ever before. The terms “well” and “chronically ill” are used cautiously here, because well children can experience a variety of health problems, and chronic illness can reflect a spectrum of severity. However, the primary focus here is on the risk of serious illness, one likely to require specialized services or result in hospitalization or death. From this perspective, the concentration of hospitalization and mortality in chronic causes suggests a growing separation of the service needs of generally well children from those of chronically ill children. This dichotomization in the challenges confronting the child health care system is likely to be expressed as growing pressures for the high-volume provision of an array of preventive interventions and general counseling for the majority of children and the increasingly complex management of children with serious chronic illnesses.³⁶

The central focus for addressing the health care needs of all children rests with the provision of primary care.³⁷ Recommendations to improve the health of children with complex health needs have relied on special programs with strong primary care services that offer high continuity of care and increased competence in coordinating linkages with subspecialty services, community-based support services, and hospital-based care, sites commonly referred to as “medical homes.”³⁸ However, recent surveys have documented that this model characterizes the care of only about half of children with special health care needs.³⁹ Other studies of children with specific chronic disorders such as asthma, cystic fibrosis, and sickle-cell disease have also found major deficiencies in the quality and coordination of services.⁴⁰ At the same time, high-quality well-child care will increasingly require improvements in the provision and documentation of a growing number of immunizations, standardized screening protocols, guidance regarding sudden infant death

syndrome (SIDS) and injury prevention, and general counseling techniques.

The reimbursement patterns of Medicaid and SCHIP continue to generate major disincentives to the development of medical homes and other comprehensive approaches to the care of chronically ill children.⁴¹ Managed care efforts have generally not improved the provision of appropriate services for these children.⁴² The Supplemental Security Income (SSI) program, while providing important cash and Medicaid benefits for some of the most seriously affected children, does not make provisions for establishing systems of care. In addition, proposals to extend coverage for “basic care” to currently uninsured children by eliminating specialized benefits for chronically ill children can only exacerbate these financial disincentives. Similarly, impulses to move away from the relatively comprehensive, mandated-benefit provisions of Medicaid toward the far more flexible structure of SCHIP could, without purposeful protections, lead to the erosion of covered benefits for chronically ill children. The implementation of medical homes will need to become the organizing principle around which child health financing and care is restructured in the years to come.

The dichotomization of child health may also require changes in the organization and training of child health care personnel. Physicians, particularly pediatricians, will need to focus more directly on the comprehensive management of children with chronic disorders. Pediatric hospitalists will play a larger role as the complexity of hospitalized patients rises. These developments could provide a much stronger platform to organize integrated primary and specialty systems of care and better coordinate the increasingly blurred lines between inpatient and outpatient care. The requirements of high-quality well-child care, on the other hand, may require a greater reliance on nonphysician health personnel who are specifically trained for and dedicated to providing this kind of care.

■ **Integrating child health over the life course.** Policies directed at improving birth outcomes have traditionally centered on improving the provision of prenatal care. However, the short duration and complex risks for extreme prematurity may defy traditional approaches that attempt to improve women’s health only after a pregnancy is confirmed.⁴³ The challenge is to improve women’s health generally; child health providers can help address this issue by introducing steps to ensure that all women who bring their children in for care are themselves receiving adequate health care.⁴⁴

There is growing evidence that many important adult diseases such as obesity, diabetes, hypertension, and cardiovascular disease are affected by events during gestation and early childhood.⁴⁵ In addition, the development early in life of health-related behavior, such as eating preferences, exercise patterns, and tobacco use, may extend into adulthood and affect the risk for a variety of adult-onset diseases. Pediatric practice may increasingly be required to manage the early precursors of such diseases. However, this clinical role will hinge on policies that support long-term, preventive interventions. Today’s high turnover of covered

“The struggle for equity in child outcomes will always be rooted in the larger struggle for social justice.”

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families within most health insurance plans provides little incentive for such support. In addition, the traditional separation between health insurance programs for children and those for the elderly will need to be bridged if long-term preventive strategies are to be supported.

The dramatic improvements in the survival of children with serious chronic illness has meant that almost a half-million children with special health care needs now reach adulthood each year.⁴⁶ However, there remains a serious gap in policies and services that support this critical transition. Discontinuities in eligibility criteria for Medicaid, SCHIP, and SSI and related programs can often leave adolescents and young adults with severe medical conditions lacking coordinated health care or support services.

■ **Technical innovation and the reduction of disparities.** The central lesson emerging from recent trends in child health disparities is less that social disparities in child health exist and more that they persist in the face of dramatic improvements in absolute levels of child health. This directly reflects the persistence of social inequalities in family well-being in the United States. Therefore, the struggle for equity in child outcomes will always be rooted in the larger struggle for social justice.

When social differences are expressed as differences in access to care, however, improvements in clinical capacity may worsen rather than reduce inequalities in health. For example, social differences in access to highly efficacious interventions such as antiretroviral therapy for HIV can exacerbate disparities in outcomes.⁴⁷

The elevated U.S. mortality rates among black children are attributable to causes that reflect a spectrum of clinical efficacy. Efforts to address prematurity will likely require improvements in the general health of young women and the development of specific interventions to prevent the apparently heterogeneous mechanisms of premature labor. Comprehensive efforts to address youth violence have relied heavily on school- and community-based strategies as well as innovative law enforcement practices.⁴⁸ More broadly, the fractious public deliberation of the availability of guns and exposure to violence in the media may give way to selected areas of consensus regarding specific child-focused protections.

The contribution of chronic illness, young-child injuries, and violence to disparities in child health implies that efforts to reduce disparities will increasingly depend on efforts to improve the quality of child health care. The medical home has particular relevance to poor children as they suffer from elevated rates of disability.⁴⁹ These observations also help frame the importance of increased cultural competency, particularly if it improves access to highly efficacious elements of care.⁵⁰ More broadly, the introduction of new clinical interventions could be accompanied by measures that specifically anticipate the potential for increased dis-

parity and augment access for traditionally underserved child populations. This objective was accomplished for the recently introduced 7-valent pneumococcal (7VPnC) vaccine, which, through extraordinary efforts by the American Academy of Pediatrics and a variety of federal and state agencies, seems to have dramatically reduced traditional disparities in invasive pneumococcal disease, a major killer of young children.⁵¹ Such policies, in turn, would benefit greatly from research into the more fundamental interaction between social stratification and the diffusion of technical innovation.⁵²

■ **The current opportunity.** Although any broad assessment of child morbidity and mortality patterns should be interpreted with caution, the remarkable reduction in the risk of serious infectious diseases during childhood places a residual set of threats to child health into greater prominence. Chronic illness, injuries, the relationship of child health over the life course, and the persistence of social disparities in child health are the primary challenges to current child health delivery systems and policies.

A growing mismatch has emerged between our current system of child health care and current threats to children's health. This mismatch is as much a product of the important success of preventive and therapeutic child health interventions as it is any failure of past programs or legislation. Nevertheless, emerging patterns of child health suggest that a major reexamination of current child health care practices and policies is warranted. Otherwise, the opportunities to address current deficiencies could pass unheeded, and the successful elements of our current systems and policies could go unprotected. In the end, however, the essential guidance for this reassessment will be provided by the epidemiology of child health, as it renders its synoptic judgment year after year as to the necessity and opportunity for fundamental reform.

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