

Decline in Sepsis-associated Neonatal and Infant Deaths in the United States, 1979 Through 1994

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ABSTRACT. *Background.* Infant mortality in the United States has continued to decline in recent years, but changes in sepsis-associated deaths among infants have not been evaluated previously.

Methods. Data from US death records were analyzed for the period 1979 through 1994 to assess trends in sepsis-associated deaths among newborns and older infants.

Results. Annual neonatal mortality associated with sepsis declined by 25% from 50.5 deaths per 100 000 live births in 1979 through 1981 to 38.0 deaths per 100 000 live births in 1992 through 1994. Although infant mortality associated with sepsis declined from 71.7 to 56.4 per 100 000 live births over the same period, this decline was attributable to lower sepsis-related mortality among newborns. The rates of sepsis-associated deaths declined for both preterm and term deliveries. Approximately 2260 infants (1521 of whom were newborns) died of sepsis per year in 1992 through 1994. Sepsis-associated death was more likely to occur among infants who were male, black, preterm, or born in the South. Among black infants, the racial gap in sepsis-associated mortality was greater for term than for preterm infants.

Conclusions. Despite declines in the overall sepsis-related mortality among newborns, racial and regional gaps in mortality persisted over the 16-year study period. Almost half of the sepsis-related deaths occurred among infants who were born prematurely. Disproportionate rates of prematurity among blacks and infants born in the South may have contributed to persistently high sepsis-related mortality in these groups. Future efforts to reduce the incidence of sepsis-associated deaths will depend on targeting higher risk populations and reducing prematurity. *Pediatrics* 1998;102(2). URL: <http://www.pediatrics.org/cgi/content/full/102/2/e18>; *sepsis, infants, neonates, neonatal mortality, infant mortality.*

ABBREVIATIONS. NCHS, National Center for Health Statistics; ICD-9, *International Classification of Diseases*, 9th Revision; NMR, neonatal mortality rate; IMR, infant mortality rate; RR, risk ratio; CI, confidence interval; GBS, group B streptococci.

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Although neonatal intensive care has reduced birth weight-specific neonatal mortality and has resulted in improved outcome for neonates, particularly those who are low birth weight and preterm, bacterial sepsis remains an important cause of morbidity and mortality.^{1,2} Reported incidence rates range from 1 to 8 per 1000 live births, and the highest rates are for low birth weight preterm infants.²⁻⁸ Bacterial sepsis contributes to prolonged hospitalization, additional hospital costs, and increased neonatal mortality.⁹⁻¹¹ Reported sepsis case fatality rates range from <under 10% to >50% for neonates and infants; the highest rates are for neonates with early-onset disease (ie, illness onset during the first week of life).² The survival of smaller, more immature infants has resulted in a larger cohort of preterm neonates and infants who are at greatest risk for bacterial sepsis.

The present study was undertaken to describe trends over a 16-year period in neonatal and infant mortality associated with bacterial sepsis, using US death certificate data.

METHODS

Multiple cause of death and natality data for the United States for 1979 through 1994 were obtained from the National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention.^{12,13} Neonatal and infant sepsis-associated deaths were identified by the *International Classification of Diseases*, 9th Revision (ICD-9).¹⁴ A sepsis-associated death was identified when at least one of the ICD-9 codes 038 to 038.9 or 771.8 was recorded anywhere on the NCHS death record (see "Appendix").

Annual neonatal and infant mortality rates (NMRs and IMRs) associated with sepsis were calculated by using US natality data¹³ and expressed as the number of deaths per 100 000 live births. NMRs and IMRs were determined overall and by sex, race, and geographic region (four standard census regions: Northeast, Midwest, South, and West). The neonatal period was defined as <28 days of life. The postneonatal period was defined as 28 days through <1 year of age, and the infant period was defined as the first year of life. The years studied were 1979 through 1994, with emphasis on the periods 1979 through 1981, 1986 through 1988, and 1992 through 1994. These periods were chosen because they represent the most recent available data and older data for comparison. They also represent times before and after the introduction of surfactant (earliest vs latest time periods). Comparisons were made between the earliest and latest periods overall and by sex, race, and region. Comparisons also were made between males and females, between different racial groups, and by region. To examine the interrelationship of prematurity and sepsis, sepsis-associated deaths with prematurity (ICD-9 codes 765.0 and 765.1) listed (preterm) and those without prematurity listed (term) were examined for the period 1992 through 1994. To calculate sepsis-associated preterm and term mortality rates, the 1993 natality data were used to represent the period 1992 through 1994, with the denominator for preterm and term defined as live births with a gestation of <37 weeks and ≥37 weeks, respectively. Risk ratios

(RRs) with 95% confidence intervals (CIs) were calculated by using Poisson regression analyses.¹⁵

RESULTS

From 1979 through 1994, there were 39 231 infant deaths associated with sepsis, of which 26 852 (68%) occurred in the neonatal period (Tables 1 and 2). The majority of neonatal deaths (64%) occurred in the first week of life (Fig 1). From 1992 through 1994, 7.2% of all neonatal deaths and 6.8% of all infant deaths were associated with sepsis.

Over the 16 years studied, both neonatal and infant mortality associated with sepsis declined substantially (Tables 1 and 2, Fig 2). The neonatal sepsis mortality rate declined from 50.5 to 38.0 per 100 000 live births (1979 through 1981, compared with 1992 through 1994), and the infant sepsis mortality rate declined from 71.7 to 56.4 over the same period, a 25% and 21% decrease, respectively. The post-NMR did not decline substantially (20.2 to 18.4 per 100 000 live births). NMRs and IMRs declined for both males and females, for blacks and whites, and in all regions.

The average annual NMR associated with sepsis was 44 deaths per 100 000 live births, with an average of 1678 neonates dying each year; the average annual sepsis IMR was 64 deaths per 100 000 live births, with an average of 2452 infants dying each year over the 16-year period 1979 through 1994. For the latest period (1992 through 1994), there were 38 neonatal deaths per 100 000 live births and 56 infant deaths per 100 000 live births, or ~1521 neonatal and 2260 infant sepsis deaths per year. Although the absolute number of neonatal and infant sepsis-associated deaths changed little over the 16-year study period, the number of total live births increased by 13% from 3 494 398 in 1979 to 3 952 767 in 1994, with a marked decline in mortality rates.

For the entire study period and for the latest 3-year period, similar differences were found by sex and race (Tables 1 and 2). During 1992 through 1994, 58% of the neonatal deaths occurred in males, and the risk

of a sepsis-associated death was significantly higher for male newborns than for females (RR = 1.3, CI = 1.2–1.4). More sepsis-associated deaths occurred among white neonates (67%) than blacks; however, the mortality rate for black newborns was higher than that for whites (RR = 2.4, CI = 2.2–2.5). When sex and race were evaluated together, black male newborns had the highest mortality rate, followed by black females, white males, white females, males of other races, and females of other races. For both male and female neonates, blacks remained ~2.5 times more likely to die with sepsis than whites. Male newborns of each race had higher sepsis-associated mortality rates than did females of the same race (black male vs black female: RR = 1.3, CI = 1.2–1.5; white male vs white female: RR = 1.3, CI = 1.2–1.4; other male vs other female: RR = 1.9, CI = 1.3–2.7). Mortality trends among infants paralleled those found for newborns.

Neonatal and infant sepsis mortality rates were highest for the South, followed by the Midwest, the Northeast, and the West (Tables 1 and 2). Mortality rates for both males and females and both blacks and whites were highest in the South and lowest in the West (Table 3). Males had higher sepsis-associated mortality rates in all regions, and in the South the rates for females were as high as the rates for males in other regions.

Sepsis was listed as the underlying cause of death for 47% of neonates with sepsis-associated deaths and 44% of infants over the entire study period, with no significant change over time. The top 10 causes of death listed with sepsis in the neonatal and infant death records are shown in Table 4. Prematurity (ICD-9 codes 765.0 or 765.1), in addition to sepsis, was recorded for 55.5% of neonates and 46.2% of infants. When 1979 through 1981 and 1992 through 1994 were compared, prematurity as an associated cause of death increased from 45.3% to 63.3% for neonates and from 37.7% to 53.6% for infants. This

TABLE 1. Sepsis Neonatal Deaths and Mortality Rates,* United States, 1979–1994

	1979–1994		1979–1981		1986–1988		1992–1994		1992–1994/1979–1981 RR (95% CI)
	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	
United States	26 852	43.8	5423	50.5	4929	43.0	4563	38.0	0.8 (0.7–0.8)
Sex									
Male	15 548	49.5	3135	57.0	2870	48.8	2649	43.1	0.8 (0.7–0.8)
Female	11 304	37.8	2288	43.7	2059	36.8	1914	32.6	0.7 (0.7–0.8)
Race									
White	17 924	37.2	3844	44.6	3233	35.9	2872	31.1	0.7 (0.7–0.7)
Black	8271	80.0	1485	84.6	1534	79.3	1555	73.5	0.9 (0.8–0.9)
Other	657	23.7	94	25.8	162	30.5	136	20.9	0.8 (0.6–1.1)
Sex/race									
White male	10 513	42.5	2253	50.9	1914	41.4	1663	35.1	0.7 (0.6–0.7)
White female	7411	31.6	1591	38.0	1319	30.1	1209	26.8	0.7 (0.7–0.8)
Black male	4675	89.1	840	94.4	865	88.1	895	83.3	0.9 (0.8–1.0)
Black female	3596	70.6	645	74.5	669	70.3	660	63.3	0.9 (0.8–1.0)
Other male	360	25.3	42	22.5	91	33.3	91	27.2	1.2 (0.8–1.7)
Other female	297	22.0	52	29.2	71	27.6	45	14.2	0.5 (0.3–0.7)
Region									
Northeast	4940	43.0	950	48.3	945	42.8	801	35.8	0.7 (0.7–0.8)
Midwest	6131	41.8	1345	47.6	1096	40.8	1006	37.2	0.8 (0.7–0.8)
South	11 034	52.6	2229	61.1	1986	50.4	1938	47.0	0.8 (0.7–0.8)
West	4747	33.6	899	39.3	902	34.2	818	27.7	0.7 (0.6–0.8)

* Sepsis neonatal mortality rates expressed as sepsis neonatal deaths per 100 000 live births.

TABLE 2. Sepsis Infant Deaths and Mortality Rates,* United States, 1979–1994

	1979–1994		1979–1981		1986–1988		1992–1994		1992–1994/1979–1981 RR (95% CI)
	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	
United States	39 231	64.0	7695	71.7	7171	62.5	6779	56.4	0.8 (0.8–0.8)
Sex									
Male	22 481	71.6	4407	80.1	4141	70.4	3833	62.3	0.8 (0.7–0.8)
Female	16 750	56.0	3288	62.9	3030	54.1	2946	50.2	0.8 (0.8–0.8)
Race									
White	25 595	53.1	5291	61.4	4604	51.1	4198	45.4	0.7 (0.7–0.8)
Black	12 545	121.3	2225	126.8	2320	119.9	2376	112.3	0.9 (0.8–0.9)
Other	1091	39.3	179	49.1	247	46.5	205	31.4	0.6 (0.5–0.8)
Sex/race									
White male	14 885	60.2	3090	69.8	2692	58.2	2389	50.4	0.7 (0.7–0.8)
White female	10 710	45.7	2201	52.6	1912	43.6	1809	40.2	0.8 (0.7–0.8)
Black male	7000	133.3	1227	137.9	1306	132.9	1328	123.6	0.9 (0.8–1.0)
Black female	5545	108.8	998	115.3	1014	106.5	1048	100.6	0.9 (0.8–1.0)
Other male	596	41.8	90	48.2	143	52.2	116	34.6	0.7 (0.5–0.9)
Other female	495	36.7	89	50.0	104	40.4	89	28.1	0.6 (0.4–0.8)
Region									
Northeast	7168	62.3	1320	67.1	1413	64.0	1182	52.8	0.8 (0.7–0.9)
Midwest	8731	59.6	1861	65.8	1523	56.8	1515	56.0	0.9 (0.8–0.9)
South	16 368	78.0	3221	88.2	2922	74.1	2867	69.5	0.8 (0.7–0.8)
West	6964	49.3	1293	56.5	1313	49.7	1215	41.2	0.7 (0.7–0.8)

* Sepsis infant mortality rates expressed as sepsis infant deaths per 100 000 live births.

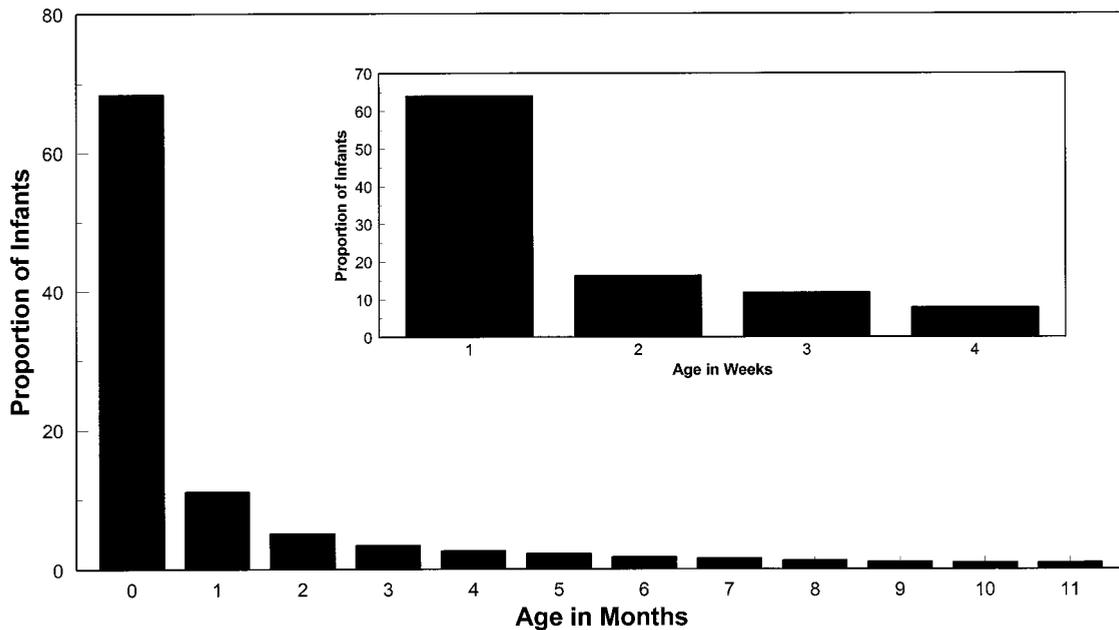


Fig 1. Distribution of infants with sepsis by age at time of death, United States, 1979–1994.

increase in prematurity was also seen by race and in each region.

Analysis of data for the period 1992 through 1994 stratified by gestational age showed that rates of sepsis-associated deaths were higher among males, blacks, and residents of the South for term as well as premature infants (Table 5). For both term and preterm infants, the racial gap was greater for sepsis-associated deaths in the postneonatal than in the neonatal period (black vs white: preterm postneonatal RR = 2.0, CI = 1.7–2.3; neonatal RR = 1.4, CI = 1.3–1.5; and term postneonatal RR = 2.5, CI = 2.2–2.7), neonatal RR = 2.1, CI = 1.9–2.3). The mortality rate for preterm infants was almost 10 times greater than that for term infants. Among preterm deliveries, sepsis-associated mortality rates were highest for

blacks in the Northeast and South, and the rate in the Northeast was substantially greater than those in the Midwest and West. Among term deliveries, blacks born in the Midwest and South had markedly higher rates of sepsis-associated deaths compared with blacks in other regions, as well as compared with whites in all regions. The racial gap in sepsis-associated death was more pronounced among term than preterm deliveries. Sepsis-associated death for preterm black infants was 1.5 times more likely than for preterm white infants, whereas the risk was 2.2 times higher for term black infants.

DISCUSSION

This study of national multiple cause of death data reveals an important decline in neonatal and infant

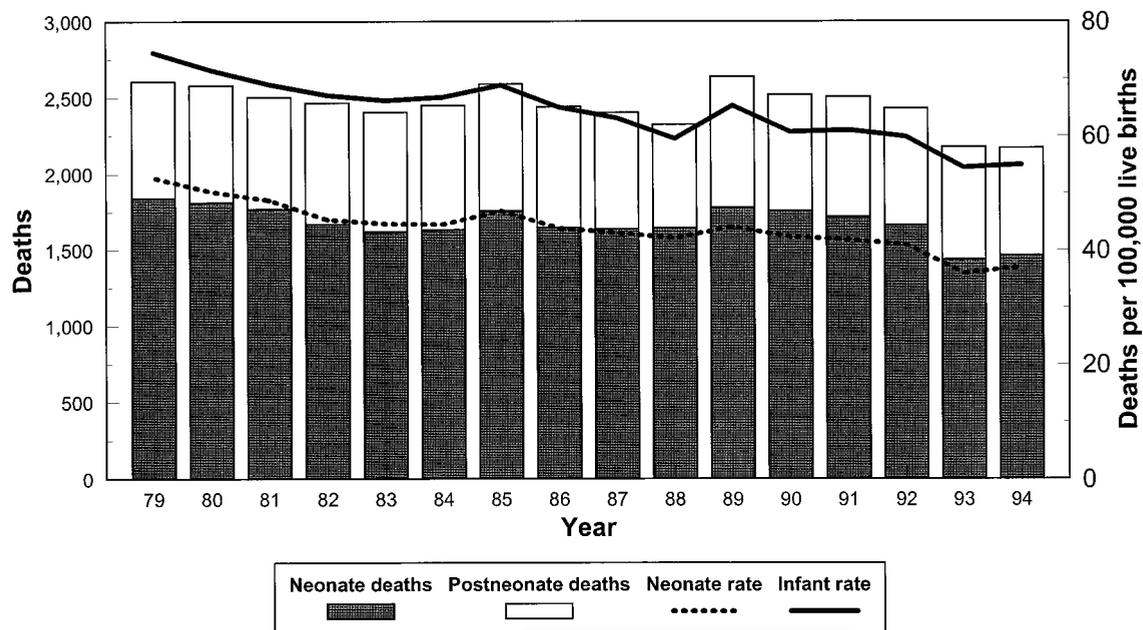


Fig 2. Sepsis-associated neonatal and infant deaths and mortality rates, United States, 1979–1994.

TABLE 3. Sepsis NMRs and IMFs* by Region and Sex and Race, United States, 1979–1994

	Region							
	Northeast		Midwest		South		West	
	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*	Deaths	Rate*
Neonatal								
Sex								
Male	2844	48.3	3600	47.9	6372	59.3	2732	37.7
Female	2096	37.4	2531	35.4	4662	45.5	2015	29.2
Race								
White	3362	36.5	4502	36.8	6358	41.8	3702	32.1
Black	1506	78.5	1533	73.8	4573	86.1	659	63.2
Other	72	20.0	96	26.8	103	21.2	386	24.5
Infant								
Sex								
Male	4066	69.0	5054	67.3	9416	87.6	3945	54.5
Female	3102	55.3	3677	51.5	6952	67.8	3019	43.8
Race								
White	4722	51.2	6289	51.4	9266	61.0	5318	46.2
Black	2335	121.8	2289	110.2	6935	130.6	986	94.6
Other	111	30.9	153	42.7	167	34.3	660	42.0

* Sepsis NMRs and IMRs expressed as sepsis neonatal and infant deaths per 100 000 live births.

deaths associated with bacterial sepsis over the 16-year period, 1979 through 1994. The decline occurred for both males and females, in all races, and for all geographic regions in the United States. The rate of sepsis-associated death declined among preterm deliveries as well as term births.

Because no national reporting system exists for cases of neonatal sepsis, sepsis deaths may serve as a proxy measure of sepsis cases. With a reported increase in preterm births¹⁶ (those at greatest risk for neonatal sepsis), one might have expected an increase in neonatal sepsis cases and subsequent deaths. The decline in sepsis deaths found in this study may be attributable to a decline in sepsis cases, to earlier identification and improved care of infected neonates and infants with reduced case fatality, or to both factors. Changes in the obstetric care of women with preterm labor, premature and/or pro-

longed rupture of the membranes, intrapartum fever, and chorioamnionitis may have resulted in a reduction in cases of neonatal sepsis. In particular, the increased use of intrapartum antibiotics to treat maternal chorioamnionitis during labor may be responsible for a reduced incidence of neonatal sepsis.^{17,18} Moreover, strategies to prevent early-onset group B streptococcal (GBS) sepsis have been the subject of both research and practice guidelines for at least the past decade.^{19–23} Clinical trials have demonstrated the effectiveness of intrapartum antibiotics to reduce early-onset GBS disease,^{19,20} and national guidelines²³ are being actively disseminated. Recent reports suggest a decrease in the incidence of early-onset GBS sepsis in several different US populations.^{24,25} Increased emphasis on prevention strategies, including intrapartum chemoprophylaxis and ultimately maternal antibacterial vaccination, are likely to lead to

TABLE 4. Top 10 Diagnoses Listed With Sepsis in Infants and Neonates, 1979–1994

Diagnosis	ICD-9 Code	Infant Deaths (%) (<i>n</i> = 39 231)	Neonatal Deaths (%) (<i>n</i> = 26 852)
Other preterm infants	765.1	12 119 (30.9)	9839 (36.6)
Other (ill-defined conditions originating in the perinatal period)	779.8	9959 (25.4)	9753 (36.3)
Extreme immaturity	765.0	7185 (18.3)	6067 (22.6)
Respiratory distress syndrome	769	5867 (15.0)	5237 (19.5)
Other respiratory problems after birth	770.8	4226 (10.8)	4103 (15.3)
Cardiac arrest	427.5	3609 (9.2)	
Shock without mention of trauma	785.5	3274 (8.4)	2153 (8.0)
Renal failure, unspecified	586	2458 (6.3)	
Necrotizing enterocolitis in fetus or newborn	777.5	2300 (5.9)	2007 (7.5)
Pneumonia, organism unspecified	486	2064 (5.3)	
Interstitial emphysema and related conditions	770.2		1796 (6.7)
Unspecified birth asphyxia in live born infant	768.9		1699 (6.3)
Intraventricular hemorrhage	772.1		1639 (6.1)

TABLE 5. Sepsis-associated Infant Deaths and Mortality Rates* by Prematurity, United States, 1992–1994

	Preterm			Term		
	Deaths	Rate	RR (95% CI)	Deaths	Rate	RR (95% CI)
United States	3632	277.9	—	3147	29.7	—
Sex						
Male	2050	293.8	1.1 (1.1–1.2)	1783	33.1	1.3 (1.2–1.4)
Female	1582	259.8	Referent	1364	26.3	Referent
Race						
White	2133	247.1	Referent	2065	24.9	Referent
Black	1413	373.7	1.5 (1.4–1.6)	963	55.8	2.2 (2.1–2.4)
Region						
Northeast	673	298.3	1.4 (1.3–1.6)	509	25.5	1.1 (1.0–1.2)
Midwest	813	277.8	1.3 (1.2–1.5)	702	29.2	1.2 (1.1–1.4)
South	1541	305.9	1.4 (1.3–1.6)	1326	36.8	1.6 (1.4–1.7)
West	605	212.4	Referent	610	23.6	Referent
Race/region						
Northeast						
White	391	260.4	Referent	350	22.2	Referent
Black	273	407.7	1.6 (1.3–1.8)	146	44.1	2.0 (1.6–2.4)
Midwest						
White	525	258.8	Referent	470	23.7	Referent
Black	273	337.9	1.3 (1.1–1.5)	221	62.9	2.7 (2.3–3.1)
South						
White	756	258.5	Referent	769	29.3	Referent
Black	768	386.2	1.5 (1.4–1.7)	539	62.4	2.1 (1.9–2.4)
West						
White	461	211.8	Referent	476	22.7	Referent
Black	99	314.1	1.5 (1.2–1.8)	57	31.6	1.4 (1.1–1.8)

* Sepsis mortality rates expressed as deaths per 100 000 live births <37 weeks' gestation for preterm infants and >36 weeks' gestation for term infants.

additional reduction in the incidence of bacterial sepsis. Several studies have reported improvements in birth weight-specific survival rates for early-onset GBS and other causes of early-onset and late-onset neonatal sepsis.^{2,26–28} Moreover, with continued advances in neonatal intensive care, including novel adjunctive approaches to the treatment of infected neonates and infants, we may see a continued decline in sepsis-associated mortality.

In this national study, greater than half of sepsis deaths occurred in neonates and infants who were born prematurely. This observation is consistent with a higher case–fatality rate for sepsis among low birth weight preterm infants.^{2,10} Male neonates and infants were significantly more likely to die with sepsis than were females. This finding is consistent with earlier studies that have reported a higher incidence of neonatal sepsis among males.²⁹ Furthermore, male infants have significantly higher NMRs and IMRs from all causes.³⁰ Black neonates and in-

fants had more than twice the risk of dying with sepsis than did white neonates and infants or those of other races. Part of this increase may relate to a higher rate of prematurity among black infants³¹ and to the known increased risk of both bacterial sepsis and sepsis mortality associated with decreasing birth weight and gestational age.^{9,10,26–28} However, we found significantly higher sepsis-associated mortality rates among term infants who were black compared with whites as well as among preterm infants who were black. For both term and preterm infants, the gap in sepsis-associated mortality rates between black and white infants was greater for postneonatal than for neonatal deaths. The increased mortality rate among black infants beyond the neonatal period is intriguing. Incidence rates of sepsis with a number of agents that cause disease in older infants (eg, pneumococci, meningococci)—but not case–fatality rates—are higher for black than for white infants.^{32,33} This increase may be related to social factors such as

crowding, artificial feeding, day care attendance, and others.^{32,33} Virtually all women in the United States deliver in hospital, and therefore nearly all newborns who become infected early in the neonatal period have access to medical care. The increased sepsis-associated mortality rate among black infants beyond the neonatal period may be explained in part by social factors, such as limited access to medical care, lack of health insurance, delays in seeking medical attention with later diagnosis of illness, and poorer quality of care.

The highest rates of sepsis mortality and the greatest proportion of neonatal and infant sepsis deaths occurred in the South. This finding may be related to an increased rate of black and preterm births (both preterm low birth weight and very low birth weight) in the South.³⁴ Race- and gestation-specific rates were highest for preterm blacks in the Northeast and South, and for term infants in the Midwest and South. Successful interventions to reduce the rate of prematurity are very likely to have a measurable effect in reducing sepsis-associated neonatal and infant mortality.

Certain limitations of this study should be noted. Deaths were classified as sepsis-associated if an ICD-9 code for sepsis was listed anywhere on the infant's death certificate. In some instances, death may have been attributable to other factors, and sepsis may have been incidental to the clinical course. However, sepsis was listed as the underlying cause of death for nearly half of newborn deaths, with no significant change in this ranking over the study period, suggesting that this analysis of trends in sepsis deaths is valid. Death certificates were not linked to birth records to verify infant's gestational ages; rather, ICD-9 codes for prematurity were used to classify deaths as occurring among preterm infants. Therefore, some deaths may have been misclassified as occurring among term rather than preterm infants. Such misclassification is unlikely to have altered our findings substantially.

The majority (>70%) of sepsis-related neonatal and infant deaths were coded using ICD-9 code 771.8 (other infections specific to the perinatal period). Very few deaths were reported using organism-specific codes, such as 038.0 (streptococcal septicemia). For the entire study period, 1979 through 1994, only 28 of 39 231 infant deaths had code 038.0 recorded on the death certificate. The new ICD-10 coding manual³⁵ has a specific code for GBS deaths. It is hoped that this specific code will be used so that changes in GBS deaths can be evaluated.

Whereas an earlier study highlighted the importance of all infectious diseases as causes of infant mortality,³⁶ the present study concentrated on death resulting from bacterial sepsis and reviewed both neonatal and infant mortality. Among infection-related deaths, bacterial sepsis deaths may be more amenable to prevention strategies, including improved maternal and obstetric care, maternal vaccination, earlier diagnosis and treatment of infected patients, and neonatal and infant immunization. This study reports a significant decline in neonatal and infant deaths associated with bacterial sepsis over

the period 1979 through 1994. Despite declines in mortality rates for both males and females for all races and in all geographic regions, noteworthy disparities in mortality rates remain, with the highest rates occurring among male infants, black infants, and infants in the South. Intervention strategies to reduce the incidence of sepsis and to improve survival of infected neonates and infants must target these high-risk groups.

APPENDIX

ICD-9 Codes Used to Identify a Sepsis-associated Death

- 038 Septicemia
- 038.0 Streptococcal septicemia
- 038.1 Staphylococcal septicemia
- 038.2 Pneumococcal septicemia
- 038.3 Septicemia due to anaerobes
- 038.4 Septicemia due to other Gram-negative organisms
- 038.8 Other specified septicemias
- 038.9 Unspecified septicemia
- 771.8 Other infection specific to the perinatal period
 - Intraamniotic infection of fetus:
 - Not otherwise specified
 - Clostridial
 - Escherichia coli*
 - Intrauterine sepsis of fetus
 - Neonatal urinary tract infection
 - Septicemia (sepsis) of newborn

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