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Epidemiologic Notes and Reports

Methemoglobinemia in an Infant — Wisconsin, 1992

Methemoglobinemia among infants is a rare and potentially fatal condition caused by genetic enzyme deficiencies, metabolic acidosis, and exposure to certain drugs and chemicals. The most widely recognized environmental cause of this problem is ingestion of nitrate-containing water. Ingestion of copper causes abdominal discomfort, nausea, diarrhea, and in cases of high-level exposure, vomiting. This report summarizes an investigation by the Division of Health, Wisconsin Department of Health and Social Services, of methemoglobinemia associated with ingestion of nitrate- and copper-containing water in an infant during 1992.

A 6-week-old girl (birth weight: 7 lbs 9 oz) was hospitalized June 1 for treatment of dehydration. On admission she weighed 6 lbs 10.5 oz and appeared "dusky." She was afebrile and had no signs of infection. A history obtained from her parents indicated that during her first 3 weeks she had appeared well and had consumed approximately 20 ounces per day of soy-based formula (consisting of a liquid concentrate diluted with 1 part water). During her 5th week, she developed loose stools and began to vomit after eating.

Diagnoses on admission included vomiting with failure to thrive and dehydration secondary to vomiting. She was treated and was discharged on June 2. On June 8, because of an acute weight loss (6 oz) and limited consumption of formula (≤3 oz) during the previous 24 hours, she was readmitted to the local hospital. On admission, she weighed 6 lbs 12 oz and appeared cachectic. Her hemoglobin level was 13 g/dL, with 21.4% methemoglobin. She continued to vomit yellow- to blue-tinged liquid following ingestion of fluids. Methemoglobinemia was diagnosed, and supportive treatment, including oral fluids and oxygen, was initiated. Within 24 hours, her methemoglobin level declined to 11.1%. Further evaluation at a referral center did not identify any underlying medical problems. Since discharge, her parents have used bottled water for drinking and for preparation of formula and food.

The family's house was situated on a river between a river bank and approximately 100 acres of corn and alfalfa. Water was supplied by a 28-foot deep vacuum-sandpoint well located in a basement pump room. Water used for drinking and food preparation was filtered by a reverse-osmosis (R/O) unit installed for nitrate removal when the

Methemoglobinemia — Continued

family purchased the house in 1989. Water samples collected from the R/O unit and from the well during the infant's hospitalization contained 9.9 mg/L and 58 mg/L nitrate-N*, respectively. During the investigation in late July, the well water contained 39.6 mg/L nitrate-N and was free of coliform bacteria. An early morning first draw sample collected from the kitchen faucet contained 7.8 mg/L copper†. Results of tests for corrosivity included a pH of 6.3 and an alkalinity of 16 mg/L (as $CaCO_3$). Flushing the kitchen faucet for several minutes reduced the copper level to 0.2 mg/L. A midday water sample from the R/O system contained 0.6 mg/L copper.

Based on these analyses, the Wisconsin Division of Health recommended that the family use bottled water for drinking and for preparation of food.

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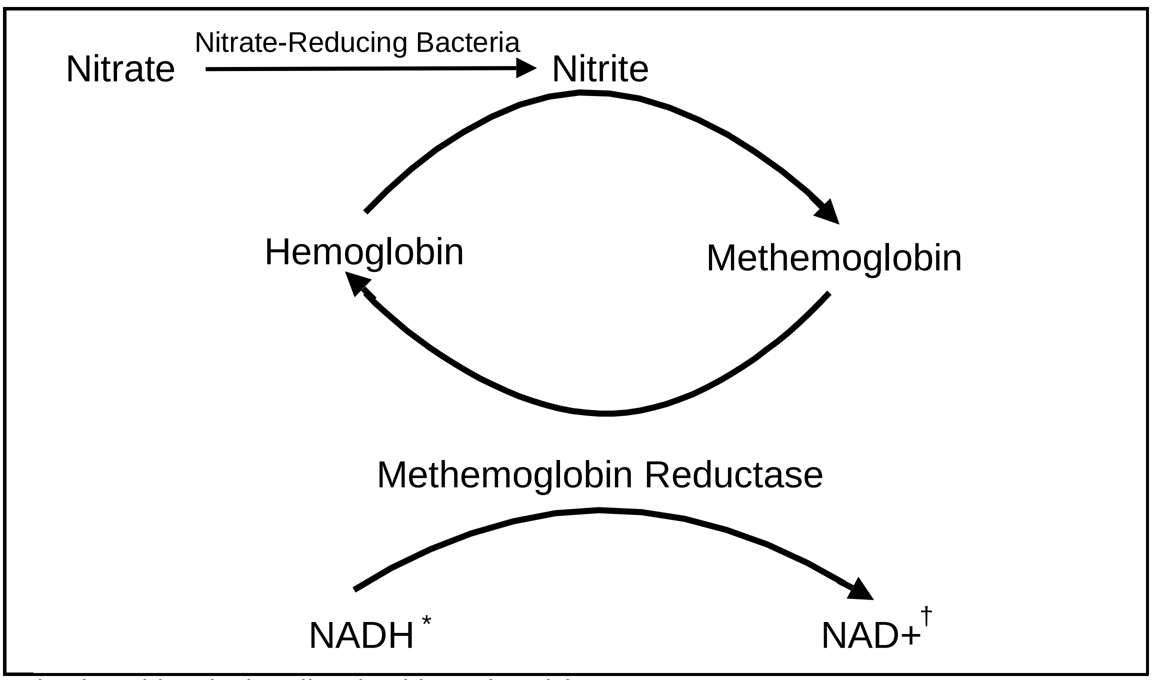
Editorial Note: In 1991 and 1992, a total of 1825 exposures to nitrates/nitrites—including 542 among children <6 years of age—from environmental and other sources were reported to the Association of Poison Control Centers (*1,2*). The most common environmental cause of methemoglobinemia in infants in the United States is ingestion of water contaminated with nitrates from agricultural fertilizers, barnyard runoff, or septic-tank effluents. Acute toxicity may result after nitrate is reduced to nitrite in the stomach and saliva (*3*). Nitrite reacts with the oxygen-carrying protein, hemoglobin, reducing it to methemoglobin (Figure 1), which is unable to transport oxygen to the

*The U.S. Environmental Protection Agency (EPA) maximum contaminant level (MCL) for nitrate-N in drinking water is 10 mg/L.
†The EPA MCL for copper in drinking water is 1.3 mg/L.

FIGURE 1. Basic reactions in the development of nitrate-induced methemoglobinemia



*Nicotinamide adenine dinucleotide, reduced form.
†Nicotinamide adenine dinucleotide.

Methemoglobinemia — Continued

tissues (*4*). Methemoglobin levels above 10% may result in clinical anoxia (*3*), and levels above 60% can cause stupor, coma, and death if the condition is not quickly treated.

The symptoms described in this report appear to have been induced by simultaneous exposure to copper and nitrates at levels close to the federal drinking water standards for these substances; this phenomenon has not previously been implicated as contributing to the development of methemoglobinemia in infants. Copper is an effective emetic and gastrointestinal irritant, and ingestion of water containing copper levels of 2.8–7.8 mg/L has been associated with vomiting and diarrhea among adults and school-aged children (*5,6*). Although the dose required to cause acute symptoms in infants is unknown, children aged <1 year may be more sensitive to copper than older persons (*7*). Elevated copper levels in water used to prepare the infant's formula may have caused loose stools and vomiting after eating. Repeated vomiting and diarrhea may have resulted in dehydration and weight loss and, in turn, reduced gastric acidity sufficiently to enhance the growth of nitrate-reducing bacteria and facilitate conversion of ingested nitrates to nitrites. In addition, systemic copper poisoning has been reported to increase methemoglobin levels independent of nitrate exposure (*8*)—an effect attributed to the ability of copper to inhibit red cell enzymes needed to reduce endogenous methemoglobin (*9*).

The major source of dissolved copper in drinking water is copper pipes in household plumbing. Water that stands overnight in copper pipes may contain copper levels that exceed the federal drinking water standard. This problem is most often associated with corrosive water supplies or with new copper pipes and can usually be prevented by flushing the household plumbing before using water for drinking or food preparation.

This report underscores that drinking water may be contaminated with nitrates and/or copper in some areas of the United States. Accordingly, health practitioners should routinely advise pregnant women that water from private wells be tested for nitrate. In addition, copper exposure should be considered in the differential diagnosis of unexplained gastrointestinal symptoms.

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Topics in Minority Health

Classification of American Indian Race on Birth and Infant Death Certificates — California and Montana

The accuracy of infant mortality rates and other indices of the health of populations depends on the consistency of information collected from separate sources (e.g., birth and death certificates). Inconsistent recording of basic information such as race and ethnicity has resulted in underestimation of mortality among minority populations, particularly minority populations other than blacks (*1*). This report summarizes studies in California and Montana that describe and measure the magnitude of differences in the recording of race for American Indians/Alaskan Natives (AI/ANs) on birth and infant death certificates.

California

Reported infant mortality rates in California often have been based on information obtained separately from birth and death certificates. To assess the accuracy of the reported rates for the state's AI/ANs, the California Area Office of the Indian Health Service (IHS) and the California Department of Health Services used the state's Birth Cohort File in which birth and death certificate information of individual infants are linked. Infant mortality rates for 1984–1988 were calculated from the Birth Cohort File using two methods for defining infant race: the pre-1989 algorithm from CDC's National Center for Health Statistics* and the IHS algorithm†. With both methods, information on parents' race was obtained from birth certificates. Numerators for infant mortality rates were deaths linked to birth certificates that met the CDC and IHS definitions for AI/AN births. Denominators were composed of all AI/AN births meeting the CDC and IHS definitions using birth certificates. All births and deaths were restricted to infants whose mothers were California residents at the time of the birth. Record linkage for this population was 100% for this study.

The aggregate number of AI/AN births for 1984–1988 was 28,668 when applying the IHS definition to unlinked birth certificate files (i.e., when death certificate data were not linked to birth certificates). In the linked Birth Cohort Files (which allow an additional year of data collection to ensure the accuracy of the data) the number of AI/AN births was 27,588 when tabulated using the CDC definition, and 29,030 using the IHS definition.

In every year, the number of AI/AN infant deaths in California was greater when calculated from the linked file than from the unlinked death certificate file, and greatest when the IHS definition was applied. The unlinked Death Statistics Master File for 1984–1988 included data from a total of 111 death certificates for AI/AN infants. In comparison, the linked file included 298 deaths when the CDC definition was used (a difference of 168%) and 315 when the IHS definition was used (a difference of 184%).

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*Based on the pre-1989 CDC algorithm in use during the study period,infants were determined to be AI/AN if on the birth certificate 1) the father was coded AI/AN *and* the mother was not coded Hawaiian or 2) if the mother was coded AI/AN *and* the father was coded AI/AN, white, or race unknown.

†According to the IHS procedure, infants were coded as AI/AN if the mother and/or father were identified as AI/AN on the birth certificate.

Race Classification — Continued

For 1984–1988, the infant mortality rate based on unlinked data was 3.9 deaths per 1000 live births. The rate was 2.8 times greater when calculated using the linked files (10.8 and 10.9 per 1000 using the CDC and IHS definitions, respectively). Both of these rates are comparable to that for AI/AN infants in all areas served by the IHS (10.9 per 1000 for AI/AN infants).

Montana

In Montana, resident birth and infant death records linked by the state vital registrar since 1980 were used to estimate errors in the reporting of race (*2,3*). All linked birth and infant death records for 1980–1989 were analyzed; less than 0.1% of these records in the state were not linked. Infant race at birth was tabulated based on 1) the mother's race—the procedure used as of 1989 in statistics tabulated by CDC—and 2) the algorithm used before 1989. Infant race at death was tabulated by three methods: 1) race as reported on the infant's death certificate—the standard method, used in the absence of linked records; 2) the mother's race as recorded on the birth certificate; and 3) the infant's race derived from the CDC algorithm used before 1989.

The number of AI/AN births based on the CDC definition (14,893) was higher than that based on mother's race (12,749). For 1980–1989, there were 1285 infant deaths of all races in Montana. For 42 (3.3%) of these, the race recorded on the death certificate differed from that on the birth certificate. Of 1036 infants who were classified as white at birth, seven (0.7%) were classified otherwise at death (one as black and six as AI/AN). In comparison, of 232 infants classified as AI/AN at birth, 29 (12.5%) were classified as white at death. The number of AI/AN infant deaths for the decade varied according to the definition of the decedents' race: 210 were reported on the death certificate, 232 were ascertained using the pre-1989 CDC algorithm, and 202 were ascertained by assignment of the mother's race.

Determination of the race at death based on the death record produced two different estimates of AI/AN infant mortality (Table 1): 16.5 per 1000 when mother's race was used to define race at birth and 14.1 per 1000 when the pre-1989 CDC algorithm was used. Use of the pre-1989 CDC algorithm to define race at death produced two higher estimates: 18.2 when the mother's race was used to define race at birth and 15.6 using the pre-1989 CDC algorithm. Finally, the rates were lowest when race of the infant at death was defined as the mother's race: 15.8 when mother's race was used to define race at birth and 13.6 when the infant's race at birth was defined by the pre-1989 CDC

TABLE 1. Rates* of American Indian/Alaskan Native (AI/AN) infant mortality, by race classification method — Montana, 1980–1989

	Race determinant at birth	
Race determinant at death	**Pre-1989 CDC algorithm†**	**Mother's race on birth certificate§**
Infant death certificate	14.1	16.5
Pre-1989 CDC algorithm	15.6	18.2
Mother's race on birth certificate	13.6	15.8

*Per 1000 live births.

†Based on the CDC algorithm in use during the study period, infants were determined to be AI/AN if on the birth certificate 1) the father was coded AI/AN *and* the mother was not coded Hawaiian or 2) if the mother was coded AI/AN *and* the father was coded AI/AN, white, or race unknown.

§CDC algorithm used since 1989.

Race Classification — Continued

algorithm. When the mother's race determined from the birth record was used as the denominator, estimated AI/AN infant mortality rates were always higher than those obtained when the pre-1989 CDC algorithm was used, independent of the method of assigning race to the infant (Table 1). The infant mortality rate for the same period calculated by standard procedures with unlinked vital records was 13.9 per 1000 live births.

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Editorial Note: From 1973 through 1987, the reported U.S. AI/AN infant mortality rate decreased from 22 to 11 infant deaths per 1000 live births (*4*). In addition, during this period cause-specific mortality rates for AI/ANs decreased 77% for gastrointestinal diseases, 76% for tuberculosis, 59% for pneumonia and influenza, and 54% for unintentional injuries (*4*). Although these trends in mortality rates suggest substantial improvements in public health status for AI/ANs, the findings in this report indicate that race-specific mortality rates can substantially underestimate disease burden when race coding is inconsistent in vital records.

Race has not been consistently defined or ascertained in public health and related data sets (*5*). For example, when infant mortality rates are calculated, the denominator generally consists of the number of births in the same year as that in which the deaths occurred. For many other mortality and morbidity rates, denominators are commonly derived from U.S. Census data that rely on respondents' self-identification. In comparison, race coding for numerator data may reflect a wider range of methods, including designation of race by next-of-kin, a coroner, or other person who certifies the death. Similarly, race coding for reportable diseases may represent the independent designation of a health-care provider.

The effect of the inconsistent race coding associated with these practices may be to obscure race-specific disease and injury burdens. The studies described in this report and in others (*1,6*) illustrate how the impact of inconsistent race coding between data sets can be estimated by linking the data sets. Previous studies linking IHS records to state death files, tumor and injury registries, and a registry for end-stage renal disease have documented underascertainment of the disease burden for AI/AN populations (*7–11*).

Vital records and registries are essential data sources for monitoring progress toward national health objectives for the year 2000 (*12*). The Indian health amendments of 1992[§] require attention to 61 AI/AN health objectives. Improved national and local surveillance of AI/AN mortality rates and other health indicators is necessary for achieving these objectives. Improvement of surveillance efforts will require assessment of fundamental concepts such as "race," "ancestry," and "ethnicity" and the meaning of these terms in different populations. These improvements also will require the use of consistent categories and measurement procedures between data-collection sources and agencies.

[§]Public Law 102-573.

Race Classification — Continued

Different definitions of race identification may serve different purposes. For example, the IHS definition corresponds to definitions of tribal membership associated with health-care benefits. The revised definition of an infant's race at birth as that of its mother (now used at the national level for purposes of published statistics) is consistent for all races. Access to national linked birth and infant death computer files, currently available for infants born from 1983 through 1987, will facilitate the computation of vital statistics with consistent definitions of race at birth and death (*13*).

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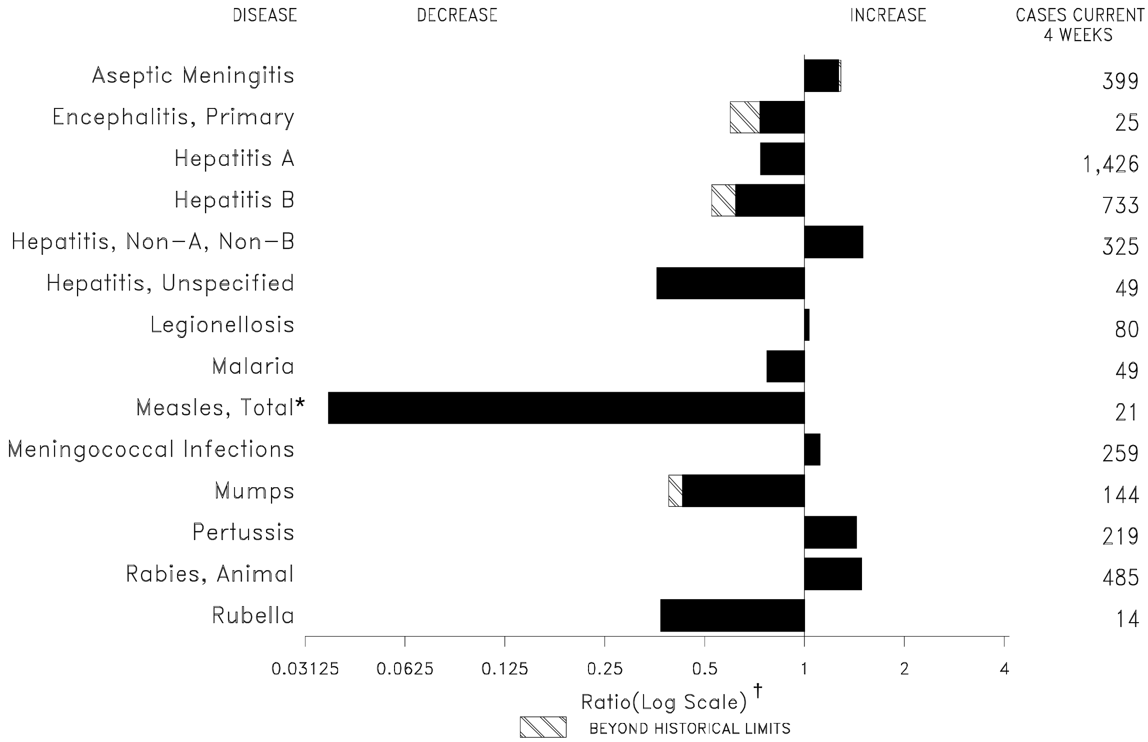
Effectiveness in Disease and Injury Prevention

Sliding-Associated Injuries in College and Professional Baseball — 1990–1991

Softball and baseball are among the most frequent causes of sports-related emergency department visits in the United States, accounting for an estimated 321,000 injuries in 1989 (*1*). Approximately 71% of softball-related injuries are caused by sliding (*2*). The use of breakaway bases substantially decreases the risk for or occurrence

(Continued on page 229)

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending March 27, 1993, with historical data — United States



*The large apparent decrease in reported cases of measles(total) reflects dramatic fluctuations in the historical baseline.

† Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where thehatched area begins is based on the mean and two standard deviations of these 4-week totals.

TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending March 27, 1993 (12th Week)

	Cum. 1993		Cum. 1993
AIDS*	10,300	Measles: imported	8
Anthrax	-	indigenous	57
Botulism: Foodborne	1	Plague	-
Infant	12	Poliomyelitis, Paralytic§	-
Other	1	Psittacosis	16
Brucellosis	16	Rabies, human	-
Cholera	5	Syphilis, primary & secondary	6,305
Congenital rubella syndrome	2	Syphilis, congenital, age < 1 year	-
Diphtheria	-	Tetanus	4
Encephalitis, post-infectious	36	Toxic shock syndrome	55
Gonorrhea	84,731	Trichinosis	7
Haemophilus influenzae (invasive disease)†	311	Tuberculosis	3,405
Hansen Disease	26	Tularemia	14
Leptospirosis	10	Typhoid fever	64
Lyme Disease	575	Typhus fever, tickborne (RMSF)	22

*Updated monthly; last update February 27, 1993.
†Of 291 cases of known age, 104 (36%) were reported among children less than 5 years of age.
§No cases of suspected poliomyelitis have been reported in 1993; 4 cases of suspected poliomyelitis were reported in 1992; 6 of the 9 suspected cases with onset in 1991 were confirmed; all were vaccine associated.

TABLE II. Cases of selected notifiable diseases, United States, weeks ending March 27, 1993, and March 21, 1992 (12th Week)

Reporting Area	AIDS*	Aseptic Menin-gitis	Encephalitis		Gonorrhea		Hepatitis (Viral), by type				Legionel-losis	Lyme Disease
			Primary	Post-in-fectious			A	B	NA,NB	Unspeci-fied		
	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1992	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993
UNITED STATES	10,300	1,415	114	36	84,731	109,189	4,678	2,292	967	129	246	575
NEW ENGLAND	679	30	3	1	1,925	2,500	155	104	1	5	9	56
Maine	8	4	1	-	24	28	6	3	-	-	1	-
N.H.	47	2	-	-	11	36	4	13	-	-	-	6
Vt.	3	2	-	-	9	4	3	1	-	-	-	-
Mass.	403	18	2	1	723	914	88	78	1	5	7	16
R.I.	29	4	-	-	96	185	36	9	-	-	1	15
Conn.	189	-	-	-	1,062	1,333	18	-	-	-	-	19
MID. ATLANTIC	2,506	115	4	4	8,887	10,994	209	254	56	3	52	407
Upstate N.Y.	236	59	-	1	1,639	886	84	86	27	1	12	274
N.Y. City	1,841	5	-	-	2,602	5,171	10	1	-	-	-	-
N.J.	195	-	-	-	1,660	1,632	77	78	21	-	7	22
Pa.	234	51	4	3	2,986	3,305	38	89	8	2	33	111
E.N. CENTRAL	787	207	32	7	17,167	20,857	519	230	180	2	66	5
Ohio	137	71	15	-	5,821	5,959	93	60	22	-	38	5
Ind.	277	33	2	3	1,842	2,094	294	48	3	-	10	-
Ill.	106	33	2	-	5,106	6,783	82	23	3	1	-	-
Mich.	224	62	11	4	3,422	5,162	47	97	149	1	16	-
Wis.	43	8	2	-	976	859	3	2	3	-	2	-
W.N. CENTRAL	377	72	3	-	3,900	5,744	686	180	43	2	10	15
Minn.	209	9	2	-	320	791	92	15	1	1	-	1
Iowa	40	21	-	-	437	378	6	5	2	1	-	1
Mo.	40	19	-	-	2,202	3,365	454	142	28	-	2	3
N. Dak.	-	1	1	-	10	25	12	-	-	-	-	-
S. Dak.	17	3	-	-	40	47	8	-	-	-	-	-
Nebr.	26	1	-	-	-	8	81	4	7	-	6	-
Kans.	45	18	-	-	891	1,130	33	14	5	-	2	10
S. ATLANTIC	2,357	373	18	17	24,454	38,117	277	374	147	20	49	60
Del.	120	2	1	-	319	401	2	36	45	-	6	41
Md.	222	32	6	-	3,922	3,822	42	69	4	1	13	7
D.C.	176	9	-	-	1,546	1,959	1	7	-	-	7	1
Va.	20	49	6	3	1,501	4,569	42	35	11	10	-	5
W. Va.	3	5	4	-	156	202	-	7	9	-	-	2
N.C.	57	28	1	-	6,068	4,628	12	23	14	-	5	3
S.C.	54	2	-	-	2,166	2,707	4	9	-	-	1	-
Ga.	268	23	-	-	3,320	13,493	32	26	20	-	12	-
Fla.	1,437	223	-	14	5,456	6,336	142	162	44	9	5	1
E.S. CENTRAL	613	88	6	1	9,928	10,936	59	265	249	-	14	3
Ky.	53	42	1	1	1,104	1,142	34	24	3	-	3	-
Tenn.	196	21	4	-	3,141	3,580	13	217	243	-	9	2
Ala.	230	19	1	-	3,388	3,770	10	22	2	-	-	1
Miss.	134	6	-	-	2,295	2,444	2	2	1	-	2	-
W.S. CENTRAL	950	56	10	-	10,431	11,235	289	221	37	24	7	5
Ark.	127	7	-	-	1,281	2,097	13	14	2	-	-	1
La.	172	2	-	-	2,452	1,666	17	25	15	-	2	-
Okla.	108	-	3	-	718	1,216	23	44	12	3	5	4
Tex.	543	47	7	-	5,980	6,256	236	138	8	21	-	-
MOUNTAIN	695	79	7	3	2,511	2,664	1,046	143	67	28	22	2
Mont.	3	-	-	1	13	16	41	4	-	-	1	-
Idaho	20	2	-	-	24	28	68	11	-	1	1	-
Wyo.	18	-	-	-	18	10	4	6	19	-	2	2
Colo.	303	23	3	-	825	1,117	255	16	10	15	1	-
N. Mex.	78	11	1	2	255	217	71	62	19	-	-	-
Ariz.	31	26	2	-	886	796	327	26	6	5	6	-
Utah	77	3	1	-	72	44	266	6	10	7	2	-
Nev.	165	14	-	-	418	436	14	12	3	-	9	-
PACIFIC	1,336	395	31	3	5,528	6,142	1,438	521	187	45	17	22
Wash.	85	-	-	-	851	978	164	43	40	3	2	-
Oreg.	88	-	-	-	350	353	32	15	3	-	-	-
Calif.	1,149	374	28	3	4,113	4,515	1,018	456	141	41	13	22
Alaska	4	3	2	-	115	189	199	3	1	-	-	-
Hawaii	10	18	1	-	99	107	25	4	2	1	2	-
Guam	-	-	-	-	12	29	-	1	-	1	-	-
P.R.	522	13	-	-	99	15	10	45	11	-	-	-
V.I.	33	-	-	-	20	23	-	1	-	-	-	-
Amer. Samoa	-	-	-	-	7	10	5	-	-	-	-	-
C.N.M.I.	-	2	-	-	15	9	-	-	-	-	-	-

N: Not notifiable U: Unavailable C.N.M.I.: Commonwealth of Northern Mariana Islands

*Updated monthly; last update February 27, 1993.

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending March 27, 1993, and March 21, 1992 (12th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1993	1993	Cum. 1993	1993	Cum. 1993	Cum. 1992	Cum. 1993	1993	Cum. 1993	1993	Cum. 1993	Cum. 1992	1993	Cum. 1993	Cum. 1992
UNITED STATES	165	3	57	-	8	444	628	71	384	46	570	261	8	29	35
NEW ENGLAND	21	2	32	-	1	7	41	-	3	14	164	25	-	1	4
Maine	-	-	-	-	-	-	3	-	-	-	3	2	-	1	-
N.H.	2	-	-	-	-	-	7	-	-	2	106	8	-	-	-
Vt.	-	1	23	-	1	-	4	-	-	-	23	-	-	-	-
Mass.	9	-	-	-	-	5	22	-	1	10	24	15	-	-	-
R.I.	1	1	1	-	-	-	1	-	1	1	2	-	-	-	4
Conn.	9	-	8	-	-	2	4	-	1	1	6	-	-	-	-
MID. ATLANTIC	22	-	1	-	-	79	73	2	34	4	92	50	-	3	4
Upstate N.Y.	12	-	1	-	-	21	32	-	12	2	37	19	-	1	2
N.Y. City	2	-	-	-	-	23	3	-	-	-	-	3	-	-	-
N.J.	4	-	-	-	-	32	7	-	1	-	11	16	-	1	2
Pa.	4	-	-	-	-	3	31	2	21	2	44	12	-	1	-
E.N. CENTRAL	15	-	-	-	-	5	91	4	68	7	89	26	-	-	6
Ohio	5	-	-	-	-	3	29	4	31	7	67	3	-	-	-
Ind.	3	-	-	-	-	1	19	-	-	-	9	8	-	-	-
Ill.	5	-	-	-	-	-	29	-	18	-	4	5	-	-	6
Mich.	2	U	-	U	-	-	13	U	19	U	8	1	U	-	-
Wis.	-	-	-	-	-	1	1	-	-	-	1	9	-	-	-
W.N. CENTRAL	1	-	-	-	-	3	32	1	13	-	22	16	-	1	1
Minn.	-	-	-	-	-	3	2	-	-	-	-	2	-	-	-
Iowa	1	-	-	-	-	-	3	1	3	-	-	1	-	-	-
Mo.	-	-	-	-	-	-	12	-	6	-	9	8	-	1	-
N. Dak.	-	-	-	-	-	-	-	-	4	-	1	2	-	-	-
S. Dak.	-	-	-	-	-	-	2	-	-	-	1	1	-	-	-
Nebr.	-	-	-	-	-	-	2	-	-	-	3	2	-	-	-
Kans.	-	-	-	-	-	-	11	-	-	-	8	-	-	-	1
S. ATLANTIC	37	-	11	-	2	49	124	57	103	7	41	32	-	2	3
Del.	1	-	-	-	-	-	6	-	1	-	-	-	-	-	-
Md.	5	-	-	-	1	3	11	1	17	5	20	13	-	1	-
D.C.	5	-	-	-	-	-	4	-	-	-	-	-	-	-	1
Va.	3	-	-	-	1	6	11	-	10	1	3	2	-	-	-
W. Va.	2	-	-	-	-	-	3	-	2	-	1	-	-	-	-
N.C.	12	-	-	-	-	9	23	55	57	-	8	6	-	-	-
S.C.	-	-	-	-	-	-	12	1	8	-	2	7	-	-	-
Ga.	2	-	-	-	-	-	34	-	-	-	3	-	-	-	-
Fla.	7	-	11	-	-	31	20	-	8	1	4	4	-	1	2
E.S. CENTRAL	4	-	-	-	-	200	39	1	13	5	26	1	-	-	-
Ky.	-	-	-	-	-	184	8	-	-	-	3	-	-	-	-
Tenn.	1	-	-	-	-	-	12	-	7	5	16	-	-	-	-
Ala.	2	-	-	-	-	-	11	-	5	-	7	1	-	-	-
Miss.	1	-	-	-	-	16	8	1	1	-	-	-	-	-	-
W.S. CENTRAL	5	-	1	-	-	62	51	5	54	3	11	9	6	7	-
Ark.	1	-	-	-	-	-	2	-	3	-	-	4	-	-	-
La.	-	-	1	-	-	-	14	-	5	3	4	-	-	-	-
Okla.	2	-	-	-	-	-	5	-	2	-	7	5	-	1	-
Tex.	2	-	-	-	-	62	30	5	44	-	-	-	6	6	-
MOUNTAIN	6	-	3	-	-	1	61	-	34	4	41	34	-	2	-
Mont.	1	-	-	-	-	-	4	-	-	-	-	-	-	-	-
Idaho	-	-	-	-	-	-	2	-	3	3	9	8	-	1	-
Wyo.	-	-	-	-	-	1	2	-	1	-	1	-	-	-	-
Colo.	3	-	2	-	-	-	6	-	3	-	11	12	-	-	-
N. Mex.	2	-	-	-	-	-	3	N	N	1	13	9	-	-	-
Ariz.	-	-	1	-	-	-	39	-	18	-	3	-	-	-	-
Utah	-	-	-	-	-	-	3	-	3	-	4	5	-	1	-
Nev.	-	-	-	-	-	-	2	-	6	-	-	-	-	-	-
PACIFIC	54	1	9	-	5	38	116	1	62	2	84	68	2	13	17
Wash.	5	-	-	-	-	7	15	-	6	-	6	12	-	-	-
Oreg.	2	-	-	-	-	-	12	N	N	-	-	4	-	1	-
Calif.	46	-	3	-	-	22	83	1	49	2	73	50	1	7	17
Alaska	-	-	-	-	-	9	3	-	2	-	1	-	-	1	-
Hawaii	1	1	6	-	5	-	3	-	5	-	4	2	1	4	-
Guam	-	U	-	U	-	4	-	U	4	U	-	-	U	-	-
P.R.	-	10	56	-	-	35	4	-	-	-	-	3	-	-	-
V.I.	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Amer. Samoa	-	U	1	U	-	-	-	U	-	U	2	-	U	-	-
C.N.M.I.	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-

*For measles only, imported cases include both out-of-state and international importations.
N: Not notifiable U: Unavailable † International § Out-of-state

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending March 27, 1993, and March 21, 1992 (12th Week)

Reporting Area	Syphilis (Primary & Secondary)		Toxic-Shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1993	Cum. 1992	Cum. 1993	Cum. 1993	Cum. 1992	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993
UNITED STATES	6,305	8,277	55	3,405	3,773	14	64	22	1,445
NEW ENGLAND	95	164	6	35	52	-	8	2	274
Maine	2	-	-	5	1	-	-	-	-
N.H.	2	12	2	1	-	-	-	-	10
Vt.	-	-	-	-	-	-	-	-	5
Mass.	45	66	4	8	30	-	6	2	82
R.I.	2	12	-	-	-	-	-	-	-
Conn.	44	74	-	21	21	-	2	-	177
MID. ATLANTIC	511	1,139	11	729	940	-	7	2	474
Upstate N.Y.	58	62	6	34	127	-	2	-	352
N.Y. City	325	615	-	488	509	-	2	-	-
N.J.	90	168	-	111	151	-	1	2	86
Pa.	38	294	5	96	153	-	2	-	36
E.N. CENTRAL	913	1,080	15	420	407	2	6	-	9
Ohio	289	151	10	58	73	-	2	-	-
Ind.	91	48	1	44	38	1	1	-	-
Ill.	300	488	-	225	196	-	2	-	-
Mich.	142	205	4	76	86	1	1	-	-
Wis.	91	188	-	17	14	-	-	-	9
W.N. CENTRAL	332	285	5	54	95	2	-	-	69
Minn.	14	24	2	-	32	-	-	-	13
Iowa	26	5	2	5	6	-	-	-	8
Mo.	267	208	-	25	35	1	-	-	1
N. Dak.	-	1	-	-	3	-	-	-	16
S. Dak.	-	-	-	6	7	-	-	-	4
Nebr.	-	1	-	5	5	-	-	-	1
Kans.	25	46	1	13	7	1	-	-	26
S. ATLANTIC	1,905	2,271	7	556	793	-	9	4	424
Del.	31	52	-	-	10	-	-	-	38
Md.	95	182	-	84	67	-	2	-	130
D.C.	199	123	-	25	34	-	-	-	3
Va.	146	154	-	115	91	-	1	-	72
W. Va.	6	3	-	19	15	-	-	-	14
N.C.	488	535	3	79	109	-	-	3	13
S.C.	299	289	-	78	81	-	-	-	30
Ga.	314	509	-	156	162	-	1	1	104
Fla.	327	424	4	-	224	-	5	-	20
E.S. CENTRAL	787	1,189	2	246	245	3	1	3	18
Ky.	66	34	1	65	77	-	-	2	2
Tenn.	218	264	1	38	-	2	-	-	-
Ala.	195	601	-	103	95	1	1	-	16
Miss.	308	290	-	40	73	-	-	1	-
W.S. CENTRAL	1,464	1,270	1	264	303	4	1	11	104
Ark.	216	170	-	27	26	3	-	-	2
La.	560	571	-	-	7	-	1	-	-
Okla.	87	67	1	24	25	-	-	11	18
Tex.	601	462	-	213	245	1	-	-	84
MOUNTAIN	58	110	2	98	91	-	2	-	16
Mont.	-	2	-	-	-	-	-	-	2
Idaho	-	1	-	2	7	-	-	-	-
Wyo.	1	-	-	-	-	-	-	-	2
Colo.	20	21	1	-	5	-	1	-	-
N. Mex.	12	11	-	10	14	-	-	-	2
Ariz.	24	40	-	58	41	-	1	-	10
Utah	1	1	1	10	6	-	-	-	-
Nev.	-	34	-	18	18	-	-	-	-
PACIFIC	240	769	6	1,003	847	3	30	-	57
Wash.	11	29	-	48	59	1	2	-	-
Oreg.	22	12	-	13	17	-	-	-	-
Calif.	205	724	6	878	703	2	26	-	48
Alaska	1	1	-	7	16	-	-	-	9
Hawaii	1	3	-	57	52	-	2	-	-
Guam	-	1	-	11	10	-	-	-	-
P.R.	141	35	-	44	40	-	-	-	15
V.I.	13	15	-	2	1	-	-	-	-
Amer. Samoa	-	-	-	1	-	-	-	-	-
C.N.M.I.	-	2	-	6	8	-	-	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,* week ending March 27, 1993 (12th Week)

Reporting Area	All Causes, By Age (Years)						P&I[†] Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	787	578	115	66	17	11	89
Boston, Mass.	189	129	21	24	8	7	30
Bridgeport, Conn.	51	38	10	2	-	1	2
Cambridge, Mass.	29	25	2	1	1	-	3
Fall River, Mass.	33	26	3	4	-	-	-
Hartford, Conn.	79	51	17	9	1	1	6
Lowell, Mass.	22	17	3	2	-	-	3
Lynn, Mass.	19	14	5	-	-	-	1
New Bedford, Mass.	29	28	1	-	-	-	3
New Haven, Conn.	51	34	4	10	3	-	3
Providence, R.I.	57	46	7	3	1	-	3
Somerville, Mass.	6	4	1	1	-	-	-
Springfield, Mass.	70	50	15	4	-	1	7
Waterbury, Conn.	52	42	7	2	1	-	9
Worcester, Mass.	100	74	19	4	2	1	19
MID. ATLANTIC	3,047	2,038	569	299	72	68	198
Albany, N.Y.	58	42	9	3	4	-	7
Allentown, Pa.	29	23	6	-	-	-	3
Buffalo, N.Y.	99	62	30	3	3	1	1
Camden, N.J.	50	27	11	9	2	1	5
Elizabeth, N.J.	27	19	5	2	-	1	3
Erie, Pa.§	37	28	7	1	1	-	1
Jersey City, N.J.	76	48	17	6	3	2	3
New York City, N.Y.	1,674	1,073	320	200	39	42	99
Newark, N.J.	69	33	20	12	4	-	-
Paterson, N.J.	28	17	5	4	1	1	-
Philadelphia, Pa.	398	286	65	33	9	5	30
Pittsburgh, Pa.§	92	64	17	6	-	5	8
Reading, Pa.	13	8	3	2	-	-	2
Rochester, N.Y.	151	119	19	7	2	4	20
Schenectady, N.Y.	33	29	3	1	-	-	2
Scranton, Pa.§	34	22	9	3	-	-	2
Syracuse, N.Y.	95	72	14	2	2	5	7
Trenton, N.J.	22	13	4	4	-	1	1
Utica, N.Y.	21	19	1	1	-	-	1
Yonkers, N.Y.	41	34	4	-	2	-	3
E.N. CENTRAL	2,410	1,532	479	206	127	66	159
Akron, Ohio	83	61	15	-	4	3	-
Canton, Ohio	46	34	8	1	1	2	6
Chicago, Ill.	512	213	120	93	73	13	16
Cincinnati, Ohio	137	102	20	6	6	3	21
Cleveland, Ohio	142	88	34	6	2	12	7
Columbus, Ohio	203	130	40	21	10	2	9
Dayton, Ohio	144	101	26	11	4	2	16
Detroit, Mich.	283	174	62	28	13	6	10
Evansville, Ind.	46	32	8	3	2	1	2
Fort Wayne, Ind.	72	50	14	6	-	2	5
Gary, Ind.	28	18	4	3	2	1	2
Grand Rapids, Mich.	52	33	12	3	-	4	5
Indianapolis, Ind.	195	148	34	3	4	6	16
Madison, Wis.	36	28	6	2	-	-	5
Milwaukee, Wis.	122	90	23	5	2	2	17
Peoria, Ill.	40	30	6	2	-	2	2
Rockford, Ill.	36	26	6	3	-	1	3
South Bend, Ind.	65	49	12	4	-	-	6
Toledo, Ohio	113	83	20	4	3	3	9
Youngstown, Ohio	55	42	9	2	1	1	2
W.N. CENTRAL	783	570	123	43	26	21	77
Des Moines, Iowa	98	69	24	3	1	1	4
Duluth, Minn.	28	19	6	2	-	1	1
Kansas City, Kans.	27	16	6	1	1	3	2
Kansas City, Mo.	U	U	U	U	U	U	U
Lincoln, Nebr.	37	22	7	3	3	2	3
Minneapolis, Minn.	262	198	35	15	10	4	29
Omaha, Nebr.	91	67	19	-	2	3	8
St. Louis, Mo.	144	111	11	13	6	3	27
St. Paul, Minn.	50	42	2	3	1	2	3
Wichita, Kans.	46	26	13	3	2	2	-
S. ATLANTIC	1,489	952	309	157	40	29	114
Atlanta, Ga.	226	144	47	28	2	5	9
Baltimore, Md.	221	137	43	35	2	4	28
Charlotte, N.C.	111	71	21	8	6	5	6
Jacksonville, Fla.	122	79	24	12	6	1	10
Miami, Fla.	114	69	28	14	1	2	1
Norfolk, Va.	98	73	13	5	5	2	11
Richmond, Va.	127	77	35	8	5	2	19
Savannah, Ga.	44	25	17	2	-	-	5
St. Petersburg, Fla.	77	65	4	4	3	1	-
Tampa, Fla.	205	134	42	21	4	3	19
Washington, D.C.	118	60	30	19	5	4	4
Wilmington, Del.	26	18	5	1	1	-	2
E.S. CENTRAL	827	562	145	73	28	19	61
Birmingham, Ala.	124	85	24	10	3	2	2
Chattanooga, Tenn.	62	47	12	3	-	-	1
Knoxville, Tenn.	68	43	13	6	6	-	6
Lexington, Ky.	49	33	9	3	2	2	5
Memphis, Tenn.	188	120	38	18	9	3	18
Mobile, Ala.	109	72	19	12	3	3	14
Montgomery, Ala.	63	46	8	7	2	-	1
Nashville, Tenn.	164	116	22	14	3	9	14
W.S. CENTRAL	1,498	940	301	164	61	31	115
Austin, Tex.	65	42	9	10	2	2	7
Baton Rouge, La.	67	52	9	3	3	-	4
Corpus Christi, Tex.	U	U	U	U	U	U	U
Dallas, Tex.	235	134	47	34	13	7	6
El Paso, Tex.	92	52	22	8	5	4	9
Ft. Worth, Tex.	102	67	20	9	2	4	6
Houston, Tex.	354	194	88	57	10	5	42
Little Rock, Ark.	77	47	18	3	7	2	8
New Orleans, La.	115	77	21	9	6	2	-
San Antonio, Tex.	225	149	43	21	10	2	14
Shreveport, La.	81	55	15	7	2	2	14
Tulsa, Okla.	85	71	9	3	1	1	5
MOUNTAIN	906	629	164	67	23	23	75
Albuquerque, N.M.	105	64	20	16	5	-	5
Colo. Springs, Colo.	44	30	8	3	1	2	5
Denver, Colo.	131	84	28	10	4	5	12
Las Vegas, Nev.	148	110	30	7	-	1	13
Ogden, Utah	23	20	1	1	1	-	5
Phoenix, Ariz.	157	114	25	9	4	5	14
Pueblo, Colo.	28	21	2	5	-	-	2
Salt Lake City, Utah	106	65	22	5	4	10	7
Tucson, Ariz.	164	121	28	11	4	-	12
PACIFIC	2,190	1,481	362	228	73	39	179
Berkeley, Calif.	19	11	4	3	1	-	2
Fresno, Calif.	79	51	16	5	4	3	4
Glendale, Calif.	29	24	3	2	-	-	4
Honolulu, Hawaii	70	47	8	10	1	4	4
Long Beach, Calif.	93	64	12	8	8	1	12
Los Angeles, Calif.	586	385	88	76	23	9	29
Pasadena, Calif.	36	24	6	2	3	1	2
Portland, Oreg.	218	156	38	17	3	2	16
Sacramento, Calif.	214	140	40	18	12	4	25
San Diego, Calif.	155	111	21	20	3	-	21
San Francisco, Calif.	142	89	20	29	4	-	4
San Jose, Calif.	163	108	36	9	5	5	19
Santa Cruz, Calif.	43	34	4	3	1	1	7
Seattle, Wash.	170	110	38	14	4	4	9
Spokane, Wash.	68	53	7	5	-	3	6
Tacoma, Wash.	105	74	21	7	1	2	15
TOTAL	13,937[¶]	9,282	2,567	1,303	467	307	1,067

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

[†]Pneumonia and influenza.

[§]Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

[¶]Total includes unknown ages.

U: Unavailable.

Sliding-Associated Injuries — Continued

of sliding-related injuries among recreational softball league players (*3*). This report summarizes the findings of a study on the impact of breakaway base use on sliding injuries among college and professional minor league baseball players (*4*).

During 1990 and 1991, 19 teams participating in the study used breakaway bases on their home field and stationary bases during away games for one of the two seasons. During the first season, the teams comprised one college and six professional minor league teams; during the second season, seven college and five minor league teams were added to the study. Base-sliding injuries and comments about the bases were recorded on a standard form by team physicians, athletic trainers, managers, or administrative staff for these teams.

During the 2-season period, the teams played an aggregate 498 away games using stationary bases and 486 home games using breakaway bases. Ten sliding injuries were recorded (2.0 per 100 games) during away games and two (0.4 per 100 games) during home games (relative risk=4.9; 95% confidence interval=1.2–19.2). Of the 10 injuries involving stationary bases, seven were ankle sprains (average participation time missed: 12 days), and three were knee injuries (one medial collateral ligament sprain and two meniscus tears that required surgery [both were season-ending]). Of the two injuries involving breakaway bases, one was a minor shoulder contusion incurred when the player slid head first into a base that did not release. The second injury occurred when a player slid toward the base and sustained an ankle fracture; however, the player did not make contact with the base.

Surveys of managers and trainers indicated that all teams planned to continue using breakaway bases. Umpires reported that breakaway bases did not complicate judgment calls (i.e., "safe" versus "out") when the bases released (54 [2.7%] of 2028 total slides on breakaway bases).

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Editorial Note: The findings in this report suggest that breakaway bases decrease the risk and severity of sliding injuries among college and minor league baseball teams (*4*). The potential public health impact of increased use of breakaway bases is important: in the United States, 712 college and 168 minor league teams compete in organized baseball. In addition, an estimated 40 million adults participate in organized softball leagues that play approximately 23 million games per year (*3,5*).

Most base-sliding injuries result from judgment errors of the runners, poor sliding technique, poor timing, and/or inadequate physical conditioning (*3*). Breakaway bases are a passive intervention that modifies the outcome of these factors. The quick-release feature of the breakaway bases decreases the impact load generated against the athlete's limb and subsequent trauma. Additional studies should assess the usefulness of age-appropriate breakaway bases in organized baseball and softball for children. Furthermore, such studies should attempt to address the effect of potential biases (e.g., nonblinding with respect to the hypothesis being tested and the need for uniform definitions of injury). The findings in this report suggest that breakaway bases should be used at all levels of adult softball and baseball play.

Sliding-Associated Injuries — Continued

References

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Current Trends

Cigarette Smoking Among Adults — United States, 1991

From 1965 through 1985, smoking prevalence in the United States declined at a rate of 0.5 percentage points per year (*1*), and from 1987 through 1990, the rate of decline accelerated to 1.1 percentage points per year (*2*). CDC monitors the use of tobacco in the United States to evaluate progress in reducing smoking prevalence. To determine the prevalence of smoking among U.S. adults during 1991, the National Health Interview Survey–Health Promotion and Disease Prevention (NHIS-HPDP) supplement collected self-reported information on cigarette smoking from a representative sample of the U.S. civilian, noninstitutionalized population aged ≥18 years. This report summarizes the results of this survey.

The overall response rate for the 1991 NHIS-HPDP was 87.8%. Participants (n=43,732) were asked: "Have you smoked at least 100 cigarettes in your entire life?" and "Do you smoke cigarettes now?" Current smokers were defined as those who reported smoking at least 100 cigarettes and who were currently smoking and former smokers as those who reported having smoked at least 100 cigarettes and who were not smoking now. Ever smokers included current and former smokers. Current smokers were then asked: "Do you now smoke cigarettes every day or some days?" Respondents reporting they smoked every day were asked: "On the average, how many cigarettes do you now smoke a day?" Data were adjusted for nonresponse and weighted to provide national estimates. Confidence intervals (CIs) were calculated using standard errors generated by the Software for Survey Data Analysis (SUDAAN) (*3*).

In 1991, an estimated 89.8 million (49.8%) adults in the United States were ever smokers, and 46.3 million (25.7%) were current smokers. Approximately 43.5 million persons (48.5% of all ever smokers [95% CI=47.7%–49.3%]) were former smokers during 1991. The proportion of former smokers among ever smokers was higher among men (51.6% [95% CI=50.4%–52.7%]) than among women (44.7% [95% CI=43.6%–45.8%]) and increased with increased education from 41.8% (95% CI=40.1%–43.6%) for those with <12 years of education to 66.1% (95% CI=64.3%–67.9%) for those with ≥16 years of education.

Cigarette Smoking — Continued

Among men, 24.0 million (28.1%) were current smokers; among women, 22.2 million (23.5%) were current smokers (Table 1). The prevalence of smoking was higher among men than among women for most sociodemographic groups (Table 1). Smoking was most prevalent among persons aged 25–44 years. The prevalence of smoking was highest among American Indians/Alaskan Natives and blacks, and lowest among Asians/Pacific Islanders. Differences between black and white adults were mainly among men. The prevalence of smoking was lower among Hispanics than non-Hispanics, reflecting the lower prevalence of smoking among Hispanic women. Cigarette smoking prevalence decreased with increasing education, and was higher among persons who lived below the poverty level* (Table 1).

*Poverty statistics are based on definitions developed by the Social Security Administration that include a set of income thresholds that vary by family size and composition.

TABLE 1. Percentage of adults who were current cigarette smokers,* by sex and by age group, race, Hispanic origin, level of education, and poverty status — United States, National Health Interview Survey, 1991†

	Men		Women		Total	
	%	(95% CI§)	%	(95% CI)	%	(95% CI)
Age (yrs)						
18–24	23.5	(21.4–25.7)	22.4	(20.5–24.3)	**22.9**	**(21.5–24.4)**
25–44	32.9	(31.7–34.1)	28.0	(27.0–29.0)	**30.4**	**(29.7–31.2)**
45–64	29.3	(27.8–30.8)	24.6	(23.4–25.8)	**26.9**	**(25.9–27.8)**
65–74	18.2	(16.3–20.1)	15.1	(13.6–16.5)	**16.5**	**(15.2–17.7)**
≥75	9.2	(7.1–11.3)	7.9	(6.7– 9.1)	**8.4**	**(7.3– 9.5)**
Race¶						
White	27.4	(26.5–28.2)	23.8	(23.1–24.5)	**25.5**	**(24.9–26.0)**
Black	35.1	(32.5–37.7)	24.4	(22.6–26.2)	**29.2**	**(27.7–30.7)**
Asian/Pacific Islander	24.2	(19.3–29.1)	7.5	(4.6–10.4)	**16.0**	**(12.9–19.1)**
American Indian/ Alaskan Native**	27.9	(20.4–35.4)	35.2	(25.1–45.3)	**31.4**	**(25.3–37.5)**
Hispanic origin						
Hispanic	25.2	(22.2–28.1)	15.5	(13.6–17.4)	**20.2**	**(18.5–21.9)**
Non-Hispanic	28.3	(27.5–29.1)	24.2	(23.5–24.9)	**26.1**	**(25.6–26.7)**
Education (yrs)						
<12	37.4	(35.4–39.3)	27.4	(25.9–28.8)	**32.0**	**(30.8–33.1)**
12	33.5	(32.3–34.8)	27.1	(26.1–28.1)	**30.0**	**(29.2–30.7)**
13–15	25.1	(23.5–26.7)	22.0	(20.7–23.3)	**23.4**	**(22.4–24.5)**
≥16	14.5	(13.4–15.7)	12.5	(11.3–13.6)	**13.6**	**(12.8–14.4)**
Poverty status††						
At/above poverty level	26.8	(25.9–27.6)	22.8	(22.1–23.4)	**24.7**	**(24.2–25.3)**
Below poverty level	39.3	(36.2–42.4)	29.3	(27.1–31.5)	**33.1**	**(31.2–35.0)**
Unknown	31.0	(28.0–34.0)	22.4	(20.4–24.4)	**26.0**	**(24.2–27.7)**
Total	**28.1**	**(27.3–28.8)**	**23.5**	**(22.8–24.1)**	**25.7**	**(25.2–26.1)**

*Persons aged ≥18 years who reported having smoked at least 100 cigarettes and who were currently smoking.
†Sample size=43,154; excludes 578 respondents with unknown smoking status.
§Confidence interval.
¶Excludes 717 respondents in unknown, multiple, and other race categories.
**Estimates should be interpreted with caution because of the small number of cases.
††Poverty statistics are based on definitions developed by the Social Security Administration that include a set of income thresholds that vary by family size and composition.

Cigarette Smoking — Continued

In 1991, the mean number of cigarettes smoked daily per smoker was 20.0 (95% CI=19.7–20.3). The mean was substantially higher for men (21.6 [95% CI=21.2–22.0]) than women (18.3 [95% CI=18.0–18.6]), for whites (21.0 [95% CI=20.7–21.3) than blacks (15.0 [95% CI=14.4–15.6]), for non-Hispanics (20.4 [95% CI=20.1–20.7]) than Hispanics (13.4 [95% CI=12.5–14.3]), and for persons at or above the poverty level (20.3 [95% CI=20.0–20.6]) than persons below the poverty level (18.7 [95% CI=18.1–19.3]).

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Editorial Note: The findings in this report indicate that the estimate of smoking prevalence in 1991 was the same as in 1990 (*2*). These findings are consistent with national household surveys on drug abuse (*4–6*), and public polls (*7*) that reveal similar patterns of declining prevalence until 1990 followed by a leveling during 1991. Among blacks and women, the prevalence of current smoking during 1991 was slightly higher than during 1990 (*2*). Factors that contributed to the leveling in smoking prevalence may include the steady growth in market share of discount cigarettes (*8*) and the recent 10.4% annual increase to an estimated $3.9 million in domestic cigarette advertising and promotional expenditures (*9*).

Differences in prevalence among racial and ethnic groups may be influenced by differences in educational levels and socioeconomic status, as well as social and cultural phenomena that require further explanation. For example, targeted marketing practices may play a role in maintaining or increasing prevalence among some groups, and affecting the differential initiation of smoking by young people (*1*). The national health objectives for the year 2000 have established special population target groups for the reduction of smoking prevalence including blacks, Hispanics, American Indians/Alaskan Natives, and Southeast Asian men (*10*).

Acceleration of the decline in smoking prevalence will require intensified efforts to discourage the use of tobacco by helping smokers break the addiction to nicotine, persuading children never to start smoking, and enacting public policies that discourage smoking. Such policies include increasing taxes on tobacco products, enforcing minors'-access laws, restricting smoking in public places, and restricting tobacco advertising and promotion (*1*).

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Cigarette Smoking — Continued

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Surveillance Summaries

Publication of *CDC Surveillance Summaries*

Since 1983, CDC has published the *CDC Surveillance Summaries* under separate cover as part of the *MMWR* series. Each report published in the *CDC Surveillance Summaries* focuses on public health surveillance; surveillance findings are reported for a broad range of risk factors and health conditions.

Summaries for each of the reports published in the most recent (December 11, 1992) issue of the *CDC Surveillance Summaries* (*1*) are provided below. All subscribers to *MMWR* receive the *CDC Surveillance Summaries*, as well as the *MMWR Recommendations and Reports*, as part of their subscriptions.

TETANUS SURVEILLANCE — UNITED STATES, 1989–1990

During the period 1989–1990, 117 cases of tetanus were reported from 34 states, for an average annual incidence of 0.02/100,000 population. Fifty-eight percent of patients were ≥60 years of age, while seven (6%) were <20 years of age, including one case of neonatal tetanus. Among adults, the risk of tetanus in those >80 years of age was more than 10 times the risk in persons ages 20–29 years. The case-fatality rate increased with age, from 17% in persons 40–49 years of age to 50% in those ≥80 years of age. Only 11% of patients reported receipt of a primary series of tetanus toxoid before disease onset, while 31% lacked a history of tetanus vaccination. Tetanus occurred following an acute injury in 78% of patients. Of patients who sought medical care, only 58% received tetanus toxoid as part of wound prophylaxis. Tetanus remains a severe disease that primarily affects unvaccinated or inadequately vaccinated older adults. Increased efforts are needed to reduce the burden of tetanus among the elderly. Health-care providers should take every opportunity to review the vaccination status of their patients and provide tetanus vaccine when indicated.

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Surveillance Summaries — *Continued*

PERTUSSIS SURVEILLANCE — UNITED STATES, 1989–1991

The licensure of whole-cell pertussis vaccine combined with diphtheria and tetanus toxoids as DTP in the 1940s—and its widespread use in infants and children—led to a dramatic decline in the incidence of reported pertussis. In the prevaccine era, the average annual incidence and mortality for reported pertussis were 150 cases and six deaths per 100,000 population, respectively. From 1989 through 1991, pertussis cases were reported by state and local health departments to CDC through two distinct national surveillance systems: the National Notifiable Diseases Surveillance System (NNDSS) and the Supplementary Pertussis Surveillance System (SPSS).

During the period 1989–1991, 11,446 pertussis cases were reported to the NNDSS (4157 in 1989; 4570 in 1990; and 2719 in 1991), for an unadjusted annual incidence of 1.7, 1.8, and 1.1 cases per 100,000 population in 1989, 1990, and 1991, respectively. For the period 1989–1991, case reports were received through the SPSS on 9480 (83%) of the 11,446 patients reported to the NNDSS. Age-specific incidence and age-specific hospitalization rates were highest among children <1 year of age and declined with increasing age.

Long-term trends suggest an underlying upward trend in the reported incidence of pertussis in the United States since 1976. The peak in reported pertussis cases in 1990 represents the highest annual incidence of pertussis since 1970. However, the incidence of pertussis declined 41% from 1990 through 1991.

Whether the long-term upward trend in reported pertussis is a true increase in incidence is unclear; the observed increase may be a function of improved surveillance. To better estimate the true incidence of pertussis, the surveillance system needs to use a sensitive and specific case definition, and the information collected needs to be as complete and accurate as possible. Because available diagnostic tests vary in sensitivity and specificity, the following steps should be taken to improve surveillance for pertussis in the United States: a) increase physician knowledge of the clinical presentation of pertussis; b) encourage more widespread use of culture, the current "gold standard" of pertussis laboratory diagnosis; and c) encourage the use of uniform clinical case definitions as recommended by the Council of State and Territorial Epidemiologists and CDC.

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Notice to Readers

Behavioral Risk Factor Surveillance System Conference

CDC will sponsor the 10th annual Behavioral Risk Factor Surveillance System (BRFSS) Conference June 7–9, 1993, in Atlanta. This year's theme is "Broadening the Perspective of BRFS." Sessions will cover the use of behavioral risk factor data, the analysis of data, an update on computer-assisted telephone interviewing systems, and the recommendations to be adopted from an evaluation of the BRFSS. State BRFSS program coordinators, survey contractors, behavioral scientists, statisticians, epidemiologists, and others involved in collecting, analyzing, and using behavioral risk factor data are invited to attend. There is no registration fee.

Additional information is available from CDC's Behavioral Risk Factor Surveillance Branch, Office of Surveillance and Analysis, National Center for Chronic Disease Pre-

The *Morbidity and Mortality Weekly Report (MMWR)* Series is prepared by the Centers for Disease Control and Prevention (CDC) and is available on a paid subscription basis from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; telephone (202) 783-3238.

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