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Epidemiologic Notes and Reports

Improper Infection-Control Practices During Employee Vaccination Programs — District of Columbia and Pennsylvania, 1993

The improper use of needles and syringes and contamination of multidose medication vials can result in transmission of bloodborne pathogens (e.g., hepatitis B virus [HBV] and human immunodeficiency virus [HIV]) and other infectious agents from patient to patient (*1–6*). Since September 1993, CDC has received reports from health-care providers and public health departments in two U.S. cities regarding improper infection-control practices during vaccination of employees at worksite vaccination programs. These practices could potentially have exposed vaccine recipients to infectious agents. This report summarizes the preliminary findings of an ongoing investigation of these reports.*

District of Columbia. A company occupational health officer reported that a physician retained to administer influenza vaccine to employees had been observed reusing needles to subsequently vaccinate other employees. Investigation by the local health department confirmed that the physician vaccinated a series of employees by using the following routine: the physician first aspirated several doses of vaccine from a multidose vial into a syringe, inoculated an employee, and then, after wiping the needle with an alcohol swab, used the same needle and syringe to subsequently inoculate another employee.

Pennsylvania. A supervisor at a worksite reported that a physician retained to administer influenza and pneumococcal vaccines to employees had been observed puncturing multidose vials of vaccine with needles that had been used previously to inoculate patients. Investigation by the local health department confirmed that the physician first aspirated a dose of influenza vaccine into a syringe and inoculated an employee; then, using the same syringe and needle, aspirated pneumococcal vaccine from a multidose vial of that vaccine and inoculated the same person. Although a new syringe and needle were used for each employee, the physician repeatedly punctured the multidose vials containing pneumococcal vaccine with used needles.

*Single copies of this report will be available free until December 17, 1994, from the CDC National AIDS Clearinghouse, P.O. Box 6003, Rockville, MD 20849-6003; telephone (800) 458-5231.

Improper Infection-Control Practices —Continued

Follow-up. Persons who received vaccinations at these worksites have been counseled and offered serotesting for bloodborne pathogens (e.g., HBV and HIV). Further investigation and follow-up of the vaccine recipients are ongoing.

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Editorial Note: This report describes examples of improper use of needles, syringes, and multidose vials that could potentially result in patient-to-patient transmission of infectious agents. For example, bacteria can survive in and have been transmitted to patients through contaminated multidose vials and syringes (*1,2,7*). HBV has been transmitted by contaminated multidose medication vials and reuse of contaminated needles and syringes (*3,4*). In addition, nosocomial patient-to-patient transmission of HIV has occurred when needles and syringes were reused without being properly sterilized (*5*) or were inadvertently reused between patients (*6*). Finally, in a laboratory simulation of improper clinical use, syringes and multidose vials became contaminated with viruses (*8*).

Reports of transmission of infectious agents by a single injection with a contaminated needle and syringe or from a multidose vial have been limited. However, the frequency with which injections are administered in health-care settings increases the likelihood of infection transmission if proper infection-control practices are not followed when medications, vaccines, and other parenteral substances are injected. The following infection-control principles are consistent with previous CDC recommendations and should be adhered to by health-care providers and all other persons who administer parenteral substances by injection (*9,10*):

- A needle or syringe that previously has been used to inoculate a patient is considered contaminated and should not be used to aspirate medication or vaccine from a multidose vial if any of the contents of the vial will subsequently be administered to another patient.
- All hypodermic needles, as well as the lumens of syringes used to administer parenteral substances, should be sterile. Needles and syringes manufactured for single use only should be discarded and should not be reprocessed or reused on a different patient because the reprocessing method may not sterilize the internal surfaces and/or may alter the integrity of the device.
- Reusable needles and syringes should be cleaned and then sterilized by standard heat-based sterilization methods (e.g., steam autoclave or dry-air oven) between uses. Reprocessing of reusable needles and syringes by use of liquid chemical germicides cannot guarantee sterility and is not recommended.
- Used needles should never be recapped or otherwise manipulated using both hands or any other technique that involves directing the point of a needle toward any part of the body. Either a one-handed "scoop" technique or a mechanical device designed for holding the needle sheath should be used if recapping is necessary. Used needles and syringes should be disposed of in puncture-resistant containers located as close as practical to where the needles and syringes are used.

Improper Infection-Control Practices —Continued

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Current Trends

Update: Respiratory Syncytial Virus Activity — United States, 1993

Respiratory syncytial virus (RSV), a common cause of communitywide outbreaks of acute respiratory disease, is associated with an estimated 90,000 hospitalizations and 4500 deaths from lower respiratory tract disease in both infants and young children in the United States (*1*). Outbreaks usually occur from late fall or early winter through spring. Since 1989, RSV activity in the United States has been monitored by the National Respiratory and Enteric Virus Surveillance System (NREVSS), a voluntary, laboratory-based system. This report summarizes surveillance results from NREVSS for RSV detections from July 1, 1993, through December 11, 1993, and assesses trends in RSV from July 1, 1990, through December 11, 1993.

A total of 69 laboratories (hospital-based, public health, and free-standing) that participate in NREVSS in 39 states report weekly to CDC the number of specimens tested for RSV by the antigen-detection and virus-isolation methods and the number of positive results. Onset of RSV activity is defined by NREVSS as the first of 2 consecutive weeks when at least half of participating laboratories reported any RSV detections or isolations.

As of November 30, 1993, 36 (59%) of the 61 laboratories reporting detections noted an increase in RSV-positive results, indicating the onset of outbreak activity for the 1993–94 winter season. By December 11, the median percentage positive had increased to 16.7%.

During the three preceding seasons (i.e., 1990–91, 1991–92, and 1992–93), nationwide onset of RSV outbreak activity began during the last week of October through mid-December; activity peaked during January–February (Figure 1). Although the

Respiratory Syncytial Virus — Continued

timing of the peak in the percentage of specimens positive for individual laboratories varied, these peaks usually occurred within 1 month of the national peak.

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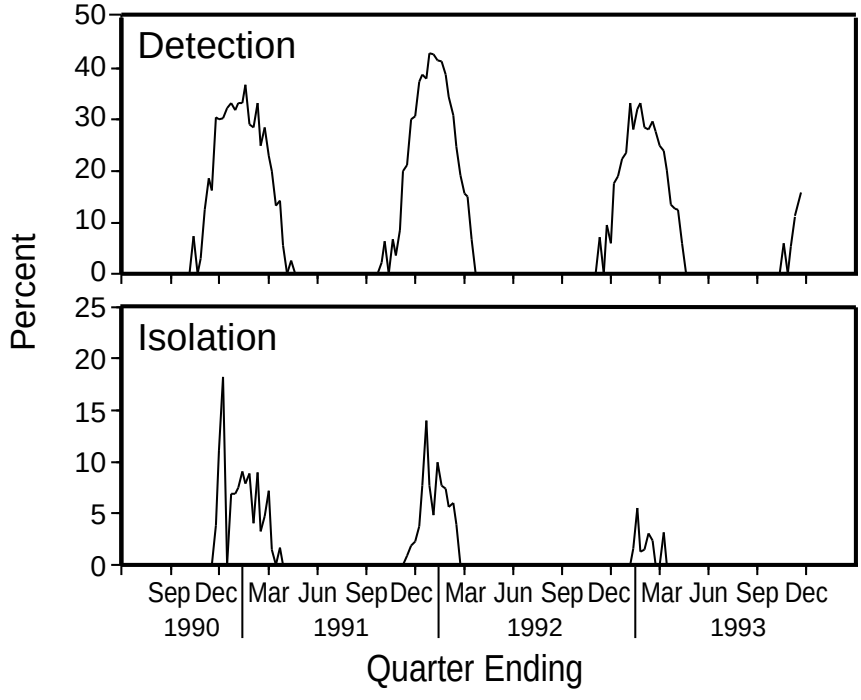
Editorial Note: With the onset of the 1993–94 RSV season, health-care providers should consider the role of RSV as a cause of acute respiratory disease in both children and adults. Most severe manifestations of infection with RSV (e.g., pneumonia and bronchiolitis) occur in infants aged 2–6 months; however, children of any age with underlying cardiac or pulmonary disease or who are immunocompromised are at risk for serious complications from this infection. Because natural infection with RSV provides limited protective immunity, RSV may cause repeated symptomatic infections throughout life. In adults, RSV usually causes upper respiratory tract manifestations but may cause lower respiratory tract disease—especially in the elderly and in persons with compromised immune systems.

RSV is a common, but preventable, cause of nosocomially acquired infection; the risk for nosocomial transmission is increased during community outbreaks. Sources for nosocomially acquired infection include infected patients, staff, visitors, or contaminated fomites. Nosocomial outbreaks or transmission of RSV can be controlled

FIGURE 1. Percentage* of specimens positive for respiratory syncytial virus, by method of confirmation† and week§ — United States, July 1, 1990–December 11, 1993



*Median percentage of positive specimens submitted by various laboratories each week.
†Positive by antigen detection or isolation.
§Data points are placed at weekly intervals. Axis labels are placed at the last reporting week of the quarter.

Respiratory Syncytial Virus — Continued

with strict attention to contact-isolation procedures (*2*). In addition, chemotherapy with ribavirin is indicated for some patients (e.g., those at high risk for severe complications or who are seriously ill with this infection) (*3*); prophylaxis with intravenous RSV immunoglobulin for high-risk patients may become available during future RSV seasons (*4*).

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International Notes

Status of Public Health — Bosnia and Herzegovina, August–September 1993

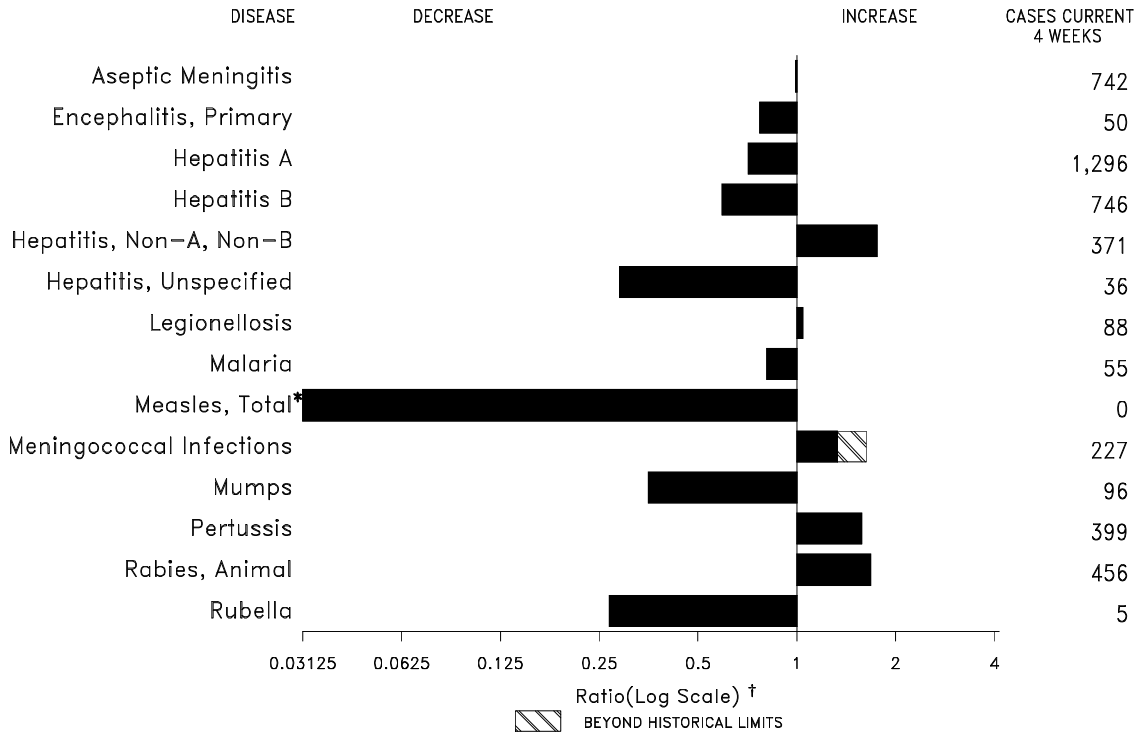
Since 1991, civil strife in the former Yugoslav republics (Figure 1) has resulted in more than 150,000 war-related casualties (*1*), approximately 3.5 million displaced persons (*2*), widespread destruction of the health infrastructure, disruption of food production and distribution, and other increased risks to public health. The impact of the war has been especially severe in Bosnia and Herzegovina (1991 population: 4.3 million) (*1*). To assist in targeting humanitarian aid to the region, in August 1993, the U.S. Agency for International Development's Office of Foreign Disaster Assistance asked CDC to assess the public health status and needs of Bosnia and Herzegovina. This report summarizes the results of that assessment and focuses on three central Bosnian regions.

This assessment was based on interviews with local public health officials and international humanitarian aid workers; reviews of data collected by local public health institutions and results of surveys conducted by United Nations (UN) agencies and nongovernment organizations (NGOs); and observations in central Bosnia (regions of Sarajevo, Zenica, and Tuzla) and Herzegovina. Because of security and time constraints, primary data could not be collected.

The principal public health impact of the war has been injuries resulting from war-related trauma. In Sarajevo, the war accounted for more than 6800 deaths from trauma (57% of all reported mortality) and 16,000 wounded persons during April 1992–March 1993 (*3*). In addition, the increase in the crude mortality rate reported in Sarajevo (2.9 deaths per 1000 population in April 1993 compared with 0.8 per month in 1991) was attributed to these casualties (*3*). In the Zenica Provincial Hospital, the proportion of surgical cases associated with trauma increased from 22% in April 1992 (the month the war began) to a peak of 78% in December 1992 and declined

(Continued on page 979)

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending December 18, 1993, with historical data — United States



*The large apparent decrease in reported cases of measles(total) reflects dramatic fluctuations in the historical baseline. (Ratio (log scale) for week fifty is 0.00000).

† 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 December 18, 1993 (50th Week)

	Cum. 1993		Cum. 1993
AIDS*	93,282	Measles: imported	56
Anthrax	-	indigenous	220
Botulism: Foodborne	21	Plague	10
Infant	53	Poliomyelitis, Paralytic§	-
Other	5	Psittacosis	50
Brucellosis	86	Rabies, human	2
Cholera	17	Syphilis, primary & secondary	25,117
Congenital rubella syndrome	7	Syphilis, congenital, age < 1 year¶	1,493
Diphtheria	-	Tetanus	40
Encephalitis, post-infectious	150	Toxic shock syndrome	212
Gonorrhea	379,397	Trichinosis	15
Haemophilus influenzae (invasive disease)†	1,201	Tuberculosis	21,199
Hansen Disease	169	Tularemia	120
Leptospirosis	41	Typhoid fever	332
Lyme Disease	7,540	Typhus fever, tickborne (RMSF)	445

*Updated monthly; last update November 27, 1993.
†Of 1147 cases of known age, 372 (32%) were reported among children less than 5 years of age.
§Two (2) cases of suspected poliomyelitis have been reported in 1993; 4 of the 5 suspected cases with onset in 1992 were confirmed; the confirmed cases were vaccine associated.
¶Reports through second quarter of 1993.

TABLE II. Cases of selected notifiable diseases, United States, weeks ending December 18, 1993, and December 12, 1992 (50th 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	93,282	12,015	864	150	379,397	466,546	20,931	11,589	4,914	587	1,205	7,540
NEW ENGLAND	4,689	415	22	8	8,082	9,823	451	461	536	19	80	1,744
Maine	119	41	2	-	81	88	15	10	4	-	6	11
N.H.	100	53	-	2	75	110	36	119	438	3	6	70
Vt.	68	44	6	-	24	26	9	10	4	-	3	5
Mass.	2,532	169	9	4	3,076	3,486	212	232	77	16	43	180
R.I.	299	108	5	2	412	613	71	21	13	-	22	267
Conn.	1,571	-	-	-	4,414	5,500	108	69	-	-	-	1,211
MID. ATLANTIC	23,757	925	61	11	43,398	54,020	1,026	1,255	380	7	238	4,288
Upstate N.Y.	3,315	546	43	6	8,873	10,955	427	420	256	1	85	2,502
N.Y. City	12,796	104	1	-	11,403	19,160	177	121	1	-	3	3
N.J.	4,982	-	-	-	5,570	7,507	274	380	86	-	33	745
Pa.	2,664	275	17	5	17,552	16,398	148	334	37	6	117	1,038
E.N. CENTRAL	7,602	2,113	209	29	81,315	88,728	2,370	1,365	560	13	318	113
Ohio	1,490	709	70	4	22,021	26,589	318	181	36	-	159	49
Ind.	846	229	22	11	7,967	8,650	625	234	18	1	56	28
Ill.	2,827	491	50	3	27,871	29,736	821	270	73	5	20	13
Mich.	1,732	629	51	11	17,606	19,611	205	388	392	7	59	23
Wis.	707	55	16	-	5,850	4,142	401	292	41	-	24	-
W.N. CENTRAL	2,783	769	47	11	20,158	25,018	2,201	625	192	16	101	259
Minn.	624	119	18	-	2,505	2,908	438	77	12	4	3	122
Iowa	172	153	5	2	1,508	1,555	58	35	9	4	18	8
Mo.	1,464	226	6	9	11,717	14,066	1,344	433	140	8	31	71
N. Dak.	2	21	4	-	40	73	79	1	3	-	2	2
S. Dak.	29	22	7	-	243	160	16	-	-	-	-	-
Nebr.	168	27	1	-	476	1,631	189	20	12	-	40	5
Kans.	324	201	6	-	3,669	4,625	77	59	16	-	7	51
S. ATLANTIC	19,841	2,528	227	57	96,936	136,846	1,211	2,180	800	86	213	897
Del.	342	77	3	-	1,507	1,696	10	163	170	-	12	423
Md.	2,039	226	25	-	16,305	15,683	157	261	38	4	54	174
D.C.	1,425	38	-	-	5,384	6,411	11	43	2	-	15	2
Va.	1,377	328	39	7	11,889	14,180	145	144	49	41	10	75
W. Va.	94	56	116	-	670	801	27	44	38	-	4	50
N.C.	1,095	264	31	-	23,941	24,306	88	290	76	-	27	84
S.C.	1,366	31	-	-	10,197	10,653	18	50	5	1	19	9
Ga.	2,547	159	2	-	4,660	36,310	100	260	174	1	36	43
Fla.	9,556	1,349	11	50	22,383	26,806	655	925	248	39	36	37
E.S. CENTRAL	2,427	741	29	7	42,885	47,040	317	1,305	994	4	41	36
Ky.	313	316	14	6	4,810	4,577	127	79	16	-	16	12
Tenn.	1,031	161	9	-	12,376	14,937	96	1,117	963	3	17	20
Ala.	689	186	3	-	15,735	16,248	56	103	5	1	2	4
Miss.	394	78	3	1	9,964	11,278	38	6	10	-	6	-
W.S. CENTRAL	9,039	1,367	75	2	44,344	51,531	2,518	1,677	371	161	39	70
Ark.	370	69	2	-	8,941	7,526	51	58	4	2	6	2
La.	1,198	83	7	-	11,560	13,904	85	209	142	4	6	2
Okla.	676	1	8	-	4,056	5,381	213	306	152	9	17	23
Tex.	6,795	1,214	58	2	19,787	24,720	2,169	1,104	73	146	10	43
MOUNTAIN	3,719	683	29	5	10,287	11,987	3,787	666	334	76	69	20
Mont.	30	1	-	1	84	106	74	7	3	-	5	-
Idaho	70	11	-	-	158	116	280	81	-	3	1	2
Wyo.	46	7	-	-	75	59	15	30	104	-	6	9
Colo.	1,245	221	15	-	3,312	4,364	827	73	52	41	9	-
N. Mex.	292	119	4	2	908	909	386	219	109	4	6	2
Ariz.	1,205	172	8	-	3,591	4,032	1,274	81	13	12	14	-
Utah	253	73	1	1	339	349	762	57	34	14	11	2
Nev.	578	79	1	1	1,820	2,052	169	118	19	2	17	5
PACIFIC	19,425	2,474	165	20	31,992	41,553	7,050	2,055	747	205	106	113
Wash.	1,467	-	1	-	3,600	3,811	843	217	183	9	10	8
Oreg.	741	-	-	-	1,122	1,606	94	33	15	1	-	2
Calif.	16,771	2,327	157	20	26,077	35,012	5,342	1,773	536	192	87	102
Alaska	96	21	6	-	589	632	712	13	10	-	-	-
Hawaii	350	126	1	-	604	492	59	19	3	3	9	1
Guam	-	6	-	-	87	53	2	3	-	11	-	-
P.R.	2,985	62	-	-	485	225	78	395	94	2	-	-
V.I.	41	-	-	-	91	105	-	5	-	-	-	-
Amer. Samoa	-	-	-	-	41	50	19	-	-	-	-	-
C.N.M.I.	-	3	1	-	71	75	-	2	-	1	-	-

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

*Updated monthly; last update November 27, 1993.

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending December 18, 1993, and December 12, 1992 (50th 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	1,150	-	220	-	56	2,210	2,310	21	1,554	54	5,774	3,197	2	189	151
NEW ENGLAND	96	-	57	-	6	65	131	-	12	1	762	279	-	2	6
Maine	6	-	1	-	-	4	15	-	-	-	22	11	-	1	1
N.H.	6	-	2	-	-	13	14	-	-	-	248	101	-	-	-
Vt.	3	-	30	-	1	-	7	-	1	-	88	14	-	-	-
Mass.	47	-	14	-	4	21	68	-	2	-	307	103	-	1	-
R.I.	7	-	1	-	1	21	1	-	2	-	13	6	-	-	4
Conn.	27	-	9	-	-	6	26	-	7	1	84	44	-	-	1
MID. ATLANTIC	214	-	11	-	7	214	269	6	124	23	867	201	-	62	10
Upstate N.Y.	120	-	-	-	2	111	117	3	43	15	347	119	-	17	7
N.Y. City	24	-	5	-	2	61	19	-	2	-	78	22	-	22	-
N.J.	45	-	6	-	3	42	43	-	12	-	64	60	-	17	3
Pa.	25	-	-	-	-	-	90	3	67	8	378	131	-	6	-
E.N. CENTRAL	74	-	21	-	6	61	364	1	238	7	1,350	710	-	8	11
Ohio	15	-	7	-	2	6	104	-	72	-	458	112	-	1	-
Ind.	3	-	1	-	-	20	58	-	8	7	165	53	-	3	-
Ill.	33	-	5	-	-	18	100	-	67	-	312	50	-	1	9
Mich.	18	-	5	-	1	13	62	1	76	-	110	15	-	2	2
Wis.	5	-	3	-	3	4	40	-	15	-	305	480	-	1	-
W.N. CENTRAL	32	-	1	-	2	14	161	-	53	1	551	308	-	1	8
Minn.	9	-	-	-	-	12	19	-	2	-	323	108	-	-	-
Iowa	5	-	-	-	-	1	27	-	10	-	37	11	-	-	3
Mo.	7	-	1	-	-	-	57	-	33	-	140	113	-	1	1
N. Dak.	2	-	-	-	-	-	3	-	5	-	5	15	-	-	-
S. Dak.	2	-	-	-	-	-	6	-	-	-	8	14	-	-	-
Nebr.	4	-	-	-	-	-	14	-	2	-	16	14	-	-	-
Kans.	3	-	-	-	2	1	35	-	1	1	22	33	-	-	4
S. ATLANTIC	304	-	17	-	13	130	404	2	446	8	649	189	-	10	20
Del.	3	-	1	-	-	1	15	-	7	-	16	7	-	2	-
Md.	51	-	-	-	4	16	50	1	80	2	141	36	-	3	5
D.C.	11	-	-	-	-	2	6	-	1	-	13	1	-	-	-
Va.	39	-	-	-	4	16	48	-	36	2	65	17	-	-	-
W. Va.	2	-	-	-	-	-	14	-	23	-	8	9	-	-	1
N.C.	101	-	-	-	-	24	67	-	224	-	196	43	-	-	-
S.C.	7	-	-	-	-	29	31	-	16	3	73	10	-	-	7
Ga.	21	-	-	-	-	3	90	1	18	1	40	17	-	-	-
Fla.	69	-	16	-	5	39	83	-	41	-	97	49	-	5	7
E.S. CENTRAL	28	-	1	-	-	467	142	1	52	4	274	31	2	4	1
Ky.	5	-	-	-	-	450	25	-	-	-	29	1	-	-	-
Tenn.	11	-	-	-	-	-	38	1	15	3	173	9	2	4	1
Ala.	7	-	1	-	-	-	48	-	22	-	60	18	-	-	-
Miss.	5	-	-	-	-	17	31	-	15	1	12	3	-	-	-
W.S. CENTRAL	32	-	7	-	3	1,107	213	3	242	-	203	237	-	18	7
Ark.	3	-	-	-	-	-	20	-	4	-	12	17	-	-	-
La.	6	-	1	-	-	-	38	-	20	-	12	13	-	1	-
Okla.	6	-	-	-	-	12	22	-	15	-	96	49	-	1	-
Tex.	17	-	6	-	3	1,095	133	3	203	-	83	158	-	16	7
MOUNTAIN	35	-	5	-	1	37	174	-	67	-	394	424	-	10	8
Mont.	2	-	-	-	-	-	13	-	-	-	11	9	-	-	-
Idaho	1	-	-	-	-	-	18	-	5	-	119	43	-	2	1
Wyo.	-	-	-	-	-	1	5	-	4	-	1	-	-	-	-
Colo.	21	-	2	-	1	31	35	-	16	-	134	104	-	1	2
N. Mex.	5	-	-	-	-	2	7	N	N	-	39	101	-	-	-
Ariz.	1	-	2	-	-	3	72	-	13	-	48	126	-	2	2
Utah	2	-	-	-	-	-	17	-	5	-	37	39	-	4	1
Nev.	3	-	1	-	-	-	7	-	24	-	5	2	-	1	2
PACIFIC	335	-	100	-	18	115	452	8	320	10	724	818	-	74	80
Wash.	28	-	-	-	-	11	72	-	10	3	85	220	-	-	8
Oreg.	6	-	-	-	-	3	30	N	N	1	38	44	-	3	2
Calif.	291	-	89	-	7	60	327	8	275	4	576	483	-	43	47
Alaska	3	-	-	-	2	9	13	-	11	-	5	15	-	1	-
Hawaii	7	-	11	-	9	32	10	-	24	2	20	56	-	27	23
Guam	2	-	4	-	-	10	1	-	10	-	-	-	-	-	3
P.R.	-	-	311	-	-	468	9	-	4	1	11	12	-	-	1
V.I.	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-
Amer. Samoa	-	-	1	-	-	-	-	-	1	-	2	6	-	-	-
C.N.M.I.	-	12	71	-	1	2	-	-	13	-	1	2	-	-	-

*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 December 18, 1993, and December 12, 1992 (50th 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	25,117	32,104	212	21,199	22,422	120	332	445	8,341
NEW ENGLAND	380	641	15	523	501	-	30	5	1,619
Maine	8	8	3	35	19	-	-	-	-
N.H.	29	37	5	9	17	-	2	-	143
Vt.	1	1	1	7	6	-	-	-	39
Mass.	122	319	5	294	286	-	22	5	687
R.I.	16	38	1	56	35	-	-	-	-
Conn.	204	238	-	122	138	-	6	-	750
MID. ATLANTIC	2,255	4,375	34	4,495	5,274	1	67	27	2,990
Upstate N.Y.	233	329	16	530	700	1	19	7	2,172
N.Y. City	1,116	2,449	1	2,573	3,067	-	26	-	-
N.J.	288	535	-	798	887	-	16	10	449
Pa.	618	1,062	17	594	620	-	6	10	369
E.N. CENTRAL	4,015	4,911	45	2,252	2,187	4	39	14	109
Ohio	1,140	803	11	304	319	-	7	8	6
Ind.	337	272	3	219	196	1	2	1	11
Ill.	1,542	2,246	8	1,189	1,132	2	21	2	23
Mich.	538	892	23	452	449	1	8	2	18
Wis.	458	698	-	88	91	-	1	1	51
W.N. CENTRAL	1,531	1,470	15	495	528	39	2	25	341
Minn.	63	92	3	73	148	-	-	1	45
Iowa	64	56	7	59	43	-	-	7	76
Mo.	1,276	1,116	2	244	227	16	2	11	25
N. Dak.	2	1	-	7	10	-	-	-	61
S. Dak.	2	-	-	14	21	17	-	3	45
Nebr.	10	24	-	18	26	3	-	2	11
Kans.	114	181	3	80	53	3	-	1	78
S. ATLANTIC	6,270	8,610	25	4,071	4,151	4	53	216	1,986
Del.	91	193	1	47	51	-	1	1	133
Md.	355	583	1	389	387	-	9	13	586
D.C.	323	378	-	158	110	-	-	-	18
Va.	644	696	7	415	325	-	6	13	382
W. Va.	13	17	-	72	89	-	-	6	89
N.C.	1,809	2,388	4	566	569	2	3	128	103
S.C.	895	1,159	-	385	381	-	-	11	160
Ga.	1,052	1,663	2	731	844	-	3	37	462
Fla.	1,088	1,533	10	1,308	1,395	2	31	7	53
E.S. CENTRAL	3,909	4,033	11	1,504	1,469	4	7	58	200
Ky.	330	172	3	366	375	1	2	11	19
Tenn.	1,042	1,155	4	424	453	2	2	32	72
Ala.	852	1,341	2	477	392	1	3	4	109
Miss.	1,685	1,365	2	237	249	-	-	11	-
W.S. CENTRAL	5,586	5,965	2	2,291	2,694	48	8	85	583
Ark.	701	858	-	193	207	27	-	9	42
La.	2,479	2,479	-	-	217	-	1	1	9
Okla.	401	447	2	155	152	17	1	70	66
Tex.	2,005	2,181	-	1,943	2,118	4	6	5	466
MOUNTAIN	223	328	14	508	583	14	10	15	168
Mont.	1	7	-	15	13	5	-	2	24
Idaho	-	1	2	13	23	-	-	-	6
Wyo.	8	8	-	6	-	3	-	10	24
Colo.	74	65	2	54	75	1	5	3	26
N. Mex.	24	40	1	59	79	2	2	-	9
Ariz.	93	158	1	235	246	-	2	-	60
Utah	11	8	6	28	65	2	1	-	4
Nev.	12	41	2	98	82	1	-	-	15
PACIFIC	948	1,771	51	5,060	5,035	6	116	-	345
Wash.	55	74	7	260	295	1	7	-	-
Oreg.	40	48	-	97	125	2	1	-	-
Calif.	837	1,636	43	4,414	4,294	3	105	-	320
Alaska	8	4	-	51	58	-	-	-	25
Hawaii	8	9	1	238	263	-	3	-	-
Guam	3	3	-	72	60	-	4	-	-
P.R.	479	324	-	233	225	-	-	-	43
V.I.	41	67	-	2	3	-	-	-	-
Amer. Samoa	-	-	-	2	-	-	1	-	-
C.N.M.I.	7	6	-	40	53	-	-	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,* week ending December 18, 1993 (50th Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	637	442	119	49	10	17	57
Boston, Mass.	174	110	38	15	5	6	25
Bridgeport, Conn.	66	47	10	6	-	3	3
Cambridge, Mass.	29	21	6	2	-	-	2
Fall River, Mass.	23	20	3	-	-	-	2
Hartford, Conn.	45	32	8	3	1	1	1
Lowell, Mass.	31	25	3	-	3	-	3
Lynn, Mass.	11	7	4	-	-	-	1
New Bedford, Mass.	28	24	2	2	-	-	2
New Haven, Conn.	47	26	15	1	1	4	2
Providence, R.I.	44	29	11	4	-	-	3
Somerville, Mass.	3	2	1	-	-	-	-
Springfield, Mass.	57	38	10	8	-	1	7
Waterbury, Conn.	34	30	1	3	-	-	1
Worcester, Mass.	45	31	7	5	-	2	5
MID. ATLANTIC	2,728	1,816	515	286	52	59	132
Albany, N.Y.	45	30	9	6	-	-	3
Allentown, Pa.	34	24	8	1	1	-	4
Buffalo, N.Y.	100	73	18	4	1	4	1
Camden, N.J.	30	16	6	5	1	2	1
Elizabeth, N.J.	16	12	2	2	-	-	3
Erie, Pa.§	45	36	6	3	-	-	4
Jersey City, N.J.	55	37	10	4	3	1	1
New York City, N.Y.	1,467	930	283	193	29	32	59
Newark, N.J.	65	30	21	11	3	-	10
Paterson, N.J.	28	13	8	4	2	1	1
Philadelphia, Pa.	395	282	72	29	5	7	20
Pittsburgh, Pa.§	79	53	18	4	1	3	10
Reading, Pa.	U	U	U	U	U	U	U
Rochester, N.Y.	108	87	13	7	-	1	8
Schenectady, N.Y.	28	18	7	1	-	2	-
Scranton, Pa.§	29	24	2	-	1	2	-
Syracuse, N.Y.	104	80	18	2	1	3	6
Trenton, N.J.	45	30	7	5	2	1	-
Utica, N.Y.	20	17	2	1	-	-	-
Yonkers, N.Y.	35	24	5	4	2	-	1
E.N. CENTRAL	1,850	1,252	358	144	43	53	115
Akron, Ohio	72	55	12	1	1	3	-
Canton, Ohio	41	25	8	6	-	2	3
Chicago, Ill.	U	U	U	U	U	U	U
Cincinnati, Ohio	146	108	22	10	3	3	20
Cleveland, Ohio	157	103	29	13	6	6	1
Columbus, Ohio	203	131	46	15	2	9	13
Dayton, Ohio	121	89	24	7	-	1	11
Detroit, Mich.	227	135	47	28	9	8	7
Evansville, Ind.	52	44	5	-	2	1	3
Fort Wayne, Ind.	83	57	17	9	-	-	4
Gary, Ind.	22	15	3	2	1	1	-
Grand Rapids, Mich.	31	22	5	2	1	1	9
Indianapolis, Ind.	194	113	48	16	6	11	12
Madison, Wis.	34	25	6	3	-	-	3
Milwaukee, Wis.	118	88	21	7	2	-	8
Peoria, Ill.	55	37	10	6	2	-	2
Rockford, Ill.	54	34	15	3	2	-	4
South Bend, Ind.	56	42	6	4	1	3	4
Toledo, Ohio	105	66	22	10	4	3	9
Youngstown, Ohio	79	63	12	2	1	1	2
W.N. CENTRAL	861	637	133	43	22	26	46
Des Moines, Iowa	81	62	12	3	2	2	5
Duluth, Minn.	28	21	5	-	-	2	3
Kansas City, Kans.	24	12	7	4	1	-	1
Kansas City, Mo.	113	77	22	4	5	5	3
Lincoln, Nebr.	39	29	5	2	2	1	4
Minneapolis, Minn.	230	177	30	13	4	6	12
Omaha, Nebr.	86	63	13	7	1	2	5
St. Louis, Mo.	150	114	22	5	4	5	5
St. Paul, Minn.	62	50	8	2	-	2	6
Wichita, Kans.	48	32	9	3	3	1	2

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
S. ATLANTIC	1,359	819	283	176	53	25	76
Atlanta, Ga.	190	99	53	25	11	2	4
Baltimore, Md.	197	109	47	32	6	3	14
Charlotte, N.C.	90	61	9	14	3	3	3
Jacksonville, Fla.	133	91	26	9	2	4	6
Miami, Fla.	135	70	28	24	12	1	2
Norfolk, Va.	60	42	5	8	4	1	3
Richmond, Va.	89	60	14	10	3	1	9
Savannah, Ga.	55	36	11	4	2	2	1
St. Petersburg, Fla.	57	44	5	4	1	3	10
Tampa, Fla.	185	119	42	20	2	1	17
Washington, D.C.	142	68	38	25	7	4	7
Wilmington, Del.	26	20	5	1	-	-	-
E.S. CENTRAL	797	531	168	68	14	16	58
Birmingham, Ala.	113	66	27	13	4	3	5
Chattanooga, Tenn.	65	48	11	5	1	-	7
Knoxville, Tenn.	106	71	29	5	-	1	7
Lexington, Ky.	64	43	17	4	-	-	6
Memphis, Tenn.	205	135	39	19	4	8	24
Mobile, Ala.	62	45	8	8	1	-	2
Montgomery, Ala.	51	36	11	1	1	2	-
Nashville, Tenn.	131	87	26	13	3	2	7
W.S. CENTRAL	1,518	977	286	157	56	41	86
Austin, Tex.	70	47	6	12	2	3	1
Baton Rouge, La.	33	18	7	4	1	3	3
Corpus Christi, Tex.	52	41	4	5	-	2	4
Dallas, Tex.	210	127	45	29	6	3	4
El Paso, Tex.	62	37	16	5	2	2	3
Ft. Worth, Tex.	92	65	16	4	5	2	6
Houston, Tex.	364	213	74	48	15	14	29
Little Rock, Ark.	71	46	13	8	1	2	5
New Orleans, La.	157	102	26	16	8	5	-
San Antonio, Tex.	199	135	40	14	8	2	16
Shreveport, La.	106	72	20	8	4	2	3
Tulsa, Okla.	102	74	19	4	4	1	12
MOUNTAIN	911	619	166	83	23	20	71
Albuquerque, N.M.	86	62	14	10	-	-	4
Colo. Springs, Colo.	67	53	8	4	1	1	6
Denver, Colo.	136	95	22	13	3	3	12
Las Vegas, Nev.	158	93	40	17	7	1	11
Ogden, Utah	30	24	4	2	-	-	3
Phoenix, Ariz.	149	85	31	15	9	9	9
Pueblo, Colo.	40	34	1	5	-	-	1
Salt Lake City, Utah	102	75	11	10	2	4	16
Tucson, Ariz.	143	98	35	7	1	2	9
PACIFIC	2,108	1,422	363	211	55	42	164
Berkeley, Calif.	U	U	U	U	U	U	U
Fresno, Calif.	144	92	29	14	6	3	12
Glendale, Calif.	24	17	5	1	1	-	1
Honolulu, Hawaii	73	51	12	3	4	3	6
Long Beach, Calif.	82	58	14	4	-	6	19
Los Angeles, Calif.	508	312	90	69	20	4	15
Pasadena, Calif.	47	30	6	5	3	3	7
Portland, Oreg.	160	121	25	8	3	3	9
Sacramento, Calif.	189	133	32	16	4	3	16
San Diego, Calif.	178	120	23	29	3	3	23
San Francisco, Calif.	169	101	39	23	-	5	8
San Jose, Calif.	212	148	43	14	2	5	29
Santa Cruz, Calif.	31	23	4	3	1	-	5
Seattle, Wash.	142	95	22	18	5	2	3
Spokane, Wash.	62	54	7	-	1	-	4
Tacoma, Wash.	87	67	12	4	2	2	7
TOTAL	12,769¶	8,515	2,391	1,217	328	299	805

*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.

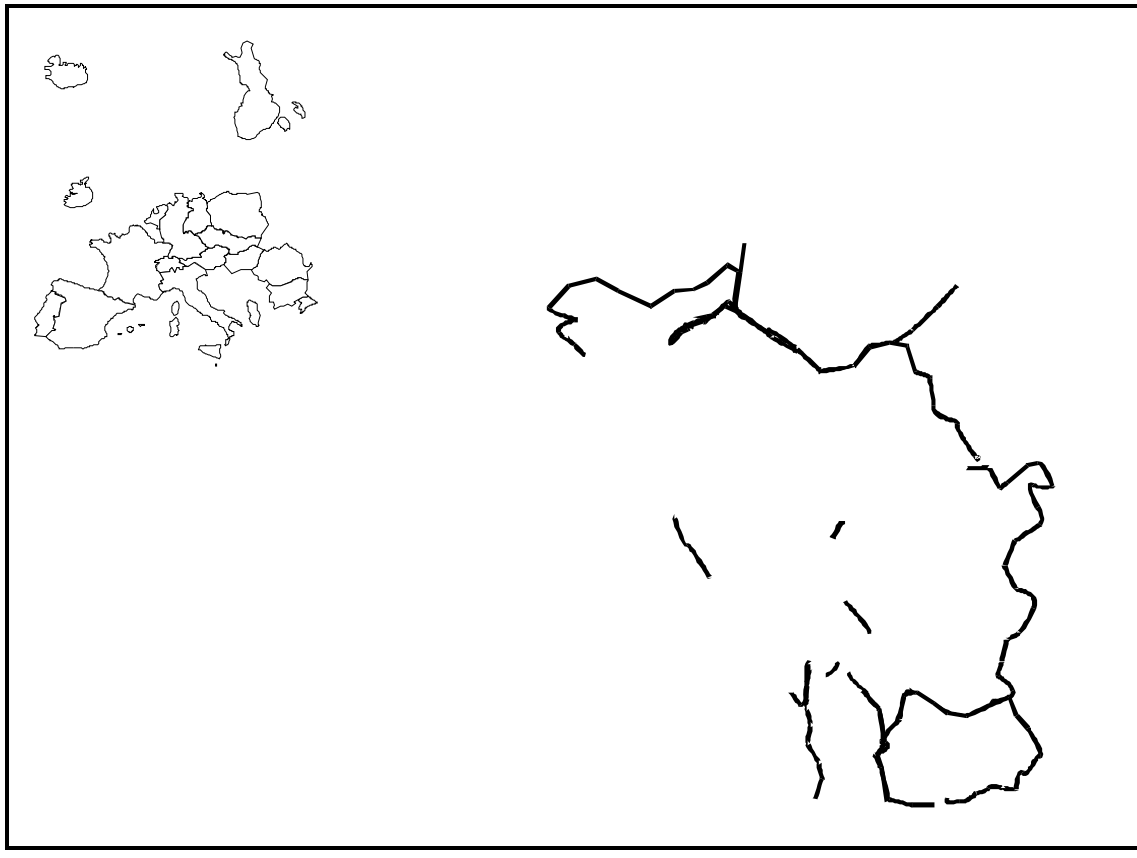
U: Unavailable.

to 40% in August 1993. Overall, 60% of surgical cases from July 1992 through August 1993 were war-related injuries.

Based on estimates of the Office of the United Nations High Commissioner for Refugees (UNHCR), the number of persons displaced from their homes in Bosnia and Herzegovina from January 1993 through August 1993 increased from 810,000 to approximately 2 million (*2*). In August 1993, approximately 90% of displaced persons were living in private homes, and 10% were housed in collective centers maintained by local and international humanitarian aid agencies.

Although increased numbers of displaced persons and the disruption of local agricultural production have intensified needs for international food aid, military forces representing different factions have intermittently blocked access by UN food convoys to central Bosnia. In August 1993, UNHCR was able to transport only 57% of basic food requirements for beneficiaries in the Zenica region and only 39% of requirements for the Tuzla region. Despite these limited rations, nutrition surveys conducted by the World Health Organization (WHO) in central Bosnia in July 1993 did not detect an increased prevalence of protein-energy malnutrition—even though the mean weight loss for adults in Sarajevo since April 1992 has been 10–12 kg per person (*4,5*).

The incidence of diagnosed cases of hepatitis A and other enteric diseases has increased in all areas of central Bosnia since the beginning of the war (Republic Institute for Public Health of Bosnia and Herzegovina, unpublished data, 1993; *6*) (Table 1). The increased occurrence of enteric diseases reflects deterioration in the quantity and



Public Health in Bosnia and Herzegovina — Continued

quality of water supplies that has resulted from diverted water sources, cracked water pipes, lack of diesel to run water pumps, and frequent losses of water pressure that, in turn, permit cross-contamination by sewage. In August 1993, for example, piped water supplies in Sarajevo were restricted to an average of 5 liters per person per day (WHO recommends daily provision of 20 liters per person to maintain health).

Although some elements of the public health system continue to function, in most areas, routine prevention programs have been curtailed. For example, in central Bosnia from June 1991 through July 1993, 33% of children aged 13–25 months had been vaccinated against measles compared with coverage rates of 90%–95% in 1990 (*4*). However, since April 1992, no outbreaks of measles had been reported (*6*). In Sarajevo, during April 1992–July 1993, inadequate prenatal-care services contributed to increases in spontaneous abortions (64%) and perinatal mortality (70%) and a 19% decrease in average birthweight (S. Simic, MD, Kosevo Hospital, Sarajevo, personal communication, 1993).

These prevention and other primary-care programs have been limited because of decreased access to the population, damaged health-care facilities, and inadequate supplies and resources. An especially critical supply hindered by the military blockade has been diesel, which cost $36 U.S. per gallon on the illegal market in Sarajevo in August 1993. Because of this fuel shortage, water pumps cannot function, health-care workers cannot travel to rural clinics, and some public health programs (e.g., garbage collection and vaccination campaigns) have been curtailed.

Reported by: Republic Institute for Public Health of Bosnia and Herzegovina, Sarajevo, Zenica, and Tuzla. Office of the World Health Organization, Regional Office for Europe, Special Representative of the Regional Director, Zagreb, Croatia. US Office of Foreign Disaster Assistance, Washington, DC. Technical Support Div, International Health Program Office, CDC.

TABLE 1. Incidence* of selected enteric diseases, by region and period — central Bosnia, 1990–1993

Region	Hepatitis A	Diarrhea	Dysentery†
Sarajevo City§			
January–June 1992	0.9	13.2	0.3
January–June 1993	5.1	94.9	4.0
% Change	*+560%*	*+719%*	*+1250%*
Zenica City¶			
May–July 1990 and May–July 1991	0.4	10.3	0.3
May–July 1993	4.6	83.9	4.4
% Change	*+1210%*	*+815%*	*+1692%*
Tuzla Region**			
1992	0.5	6.5	0.5
January–June 1993	1.9	9.3	0.4
% Change	*+358%*	*+43%*	*–10.0%*

*Per 100,000 population per month.
†An unspecified proportion of cases were confirmed as caused by either *Shigella sonnei* or *S. flexneri*.
§Regional Institute of Public Health, Sarajevo. Assumes a prewar population of 361,000 and a current population of 300,000.
¶Regional Institute of Public Health, Zenica. Assumes a prewar population of 130,000 and a current population of 195,000.
**Regional Institute of Public Health, Tuzla. Assumes a prewar and current population of 700,000.

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Editorial Note: During war-related emergencies in developing countries, infectious diseases consistently have been reported as the leading cause of morbidity and mortality in the affected civilian populations (*7*). However, the proportion of deaths in the civilian population attributed to war-related injuries in Bosnia is among the highest documented in recent humanitarian emergencies related to civil war (*7*). By comparison, population surveys in central and southern Somalia determined that trauma deaths accounted for 4%–11% of mortality during April 1992–January 1993 (CDC, unpublished data, 1993).

Although increases in enteric disease-related mortality have not been reported, the fivefold to 16-fold increases in the incidence rates of diarrheal disease and hepatitis A from 1990 through 1993 in three central Bosnian regions underscore the urgent need for improvements in water and sanitation. Rates of infectious diseases in Bosnia are lower than those reported in civil wars in developing countries and may reflect at least five factors: 1) disease reporting has been incomplete; 2) most displaced persons are residing in private homes rather than in mass camps; 3) elements of a previously well functioning local public health system are still operating; 4) public health efforts of UN agencies and NGOs have supplemented local programs; and 5) a well educated, resourceful population has maintained relatively high standards of personal hygiene (S. Sahadzic, United Nations Children's Fund, Sarajevo, personal communication, 1993).

The limited occurrence of vaccine-preventable diseases in Bosnia and Herzegovina may reflect high prewar vaccination rates and the relative absence of crowded camps that have characterized other refugee emergencies. However, measles epidemics have occurred in countries with measles vaccine coverage levels of 70% or higher (*8*) and the potential for such outbreaks remains high in central Bosnia.

Even though the availability and distribution of food rations have been limited in Bosnia, WHO surveys suggest low prevalences of acute malnutrition. This finding may reflect a combination of four factors: 1) the presence of substantial household food reserves in 1992 (*3*); 2) a baseline (i.e. prewar) prevalence of elevated body mass index (*9*); 3) effective food distribution efforts by UNHCR from 1992 until July 1993 (*2*); and 4) food deliveries by commercial trucks through regular trade routes from Croatia and Serbia until April 1993 (*3*).

This assessment was limited by the degree of underreporting and diminished sensitivity of currently operating surveillance systems. Because reports of health status provided by government sources under such circumstances may be subject to bias, independent public health surveillance and assessments should be conducted to ensure the accuracy of such reports.

Priorities for relief efforts in Bosnia and Herzegovina may differ from those usually recommended for complex disasters in developing countries (*7*). Moreover, during 1994, the public health of residents of this region may be further threatened by lack of access by international relief agencies, limited food and fuel reserves, a likely increase in the nutritionally vulnerable population (especially children, the elderly, and pregnant women), and the severity of the winter. In addition to the identification of secure routes of access and transportation of diesel into central Bosnia, recommendations for immediate action by appropriate UN agencies and NGOs have included strengthening of programs for water and sanitation, childhood vaccination, and prenatal care and expansion of the WHO health monitoring and nutritional surveillance system.

Public Health in Bosnia and Herzegovina — Continued

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Notice to Readers

Prevention 94 Conference

CDC and other national health agencies will cosponsor the 11th annual national preventive medicine meeting, "Prevention 94: Science, Skills, and Strategies," in Atlanta March 19–22, 1994. The conference will address sexually transmitted diseases, acquired immunodeficiency syndrome, cardiovascular disease risk factors, preventive medicine education, prevention of injuries and violence, clinical practice guidelines, infectious diseases, and maternal and infant health. Registration information is available from the Meetings Manager, Prevention 94, 1015 15th Street, NW, Suite 403, Washington, DC 20005; telephone (202) 789-0006.

Notice to Readers

Combined Issues of *MMWR*

A December 31, 1993, issue of *MMWR* will not be published. The next issue will be Volume 42, Numbers 51 and 52, dated January 7, 1994, and will include the figure and tables on notifiable diseases and deaths for the weeks ending December 25, 1993, and January 1, 1994.

Erratum: Vol. 42, No. RR-15

In the *MMWR Recommendations and Reports*, "Tuberculosis Control Laws—United States, 1993: Recommendations of the Advisory Council for the Elimination of Tuberculosis (ACET)," dated November 12, 1993, on page 1, the first sentence of the summary should read "Because of its communicable nature and because there are many state laws specific to the control of tuberculosis (TB), TB is managed differently than other *airborne* infectious diseases."

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