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Public Health Consequences of a Flood Disaster — Iowa, 1993

Unprecedented amounts of rain in the spring and summer of 1993 led to disastrous flooding and crop damage in nine Midwestern states. In Iowa (1990 population: 2,777,000), extensive flood damage occurred in all 99 counties. On July 11, 1993, the Iowa Department of Public Health (IDPH) requested assistance from CDC to assess the adverse public health impact of the flooding and to plan the public health response to the disaster. CDC assisted IDPH in performing an initial rapid statewide public health assessment and establishing weekly surveillance to monitor ongoing or anticipated flood-related health problems. This report summarizes the methods of the assessment and surveillance and preliminary findings.

On July 15 and 16, IDPH conducted a telephone survey of all 99 county public health officers to assess the impact of the flood on the state's public health infrastructure. Interviewers used a standardized questionnaire to gather information regarding the availability of medical, pharmaceutical, and public health services; operations of public water, sewer, and solid-waste disposal systems; presence of toxic hazards; and increases in the presence of vectors (e.g., rodents or biting insects).

Five of the 99 counties, representing 14% of Iowa's population, reported closures of primary-care physician offices. Closures per county ranged from one office in Van Buren County (1990 population: 7676) to approximately 200 offices in Polk County (1990 population: 324,140). Eight counties (24% of the state population) reported interruptions in public health services (e.g., vaccination clinics; Special Supplemental Food Program for Women, Infants, and Children; and sexually transmitted diseases clinics). Every county had at least one operating pharmacy. Des Moines, in Polk County, was the only community without an operating public water system; the loss of this system affected more than 250,000 persons (9% of the population). Ten counties (15% of the population) reported at least one nonoperational public sewer system, and 45 counties (53% of the population) reported vector problems.

Because flood-related public health problems were expected to continue into the recovery phase of this disaster, IDPH established a special statewide public health surveillance system. In this system, county public health officers complete weekly questionnaires, based on information obtained from area medical, mental health, and substance-abuse facilities, and county sanitation departments. The questionnaires ask whether, since the last report, the availability of medical or public health services have deteriorated and whether increases above baseline have occurred in reported cases of diarrheal illnesses, admissions for flood-related illnesses or injuries, or admissions to

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substance-abuse or mental health programs. Other information obtained includes the number of public or private water or sewer systems in need of rehabilitation, whether solid-waste collection or disposal efforts have been hampered, and whether vectors are a problem.

For the week of July 18–24, the number of counties reporting limitations in availability of medical or public health services decreased from eight (24% of the population) during the July 15–16 assessment to four (3% of the population). No outbreaks of diarrheal disease were identified. Seven counties (14% of the population) reported persons hospitalized for the following flood-related illnesses or injuries: carbon monoxide poisoning (related to the indoor use of gasoline-powered generators), hypothermia, electrocution, wound infections, and exacerbation of chronic illnesses. Two counties (2% of the population) reported increases in admissions to substance-abuse programs, and nine counties (16% of the population) reported increases in admissions to mental health facilities. Twenty-nine counties (37% of the population) reported flood damage to water systems, and 31 counties (35% of the population) reported flood damage to sewer systems. The number of damaged systems (mostly private) per county ranged from one to 1000. Twelve counties (12% of the population) reported problems with solid-waste disposal; 35 counties (33% of the population) reported increased complaints about mosquitoes and rats—a decrease from 45 counties on July 16. These surveillance results were validated and other local concerns were identified on July 27–28 when multidisciplinary IDPH teams (medical, environmental, and social services) met with local officials (government, emergency preparedness, hospital, public health, and social services) in the 12 most severely affected counties.

To ensure detection of possible waterborne infectious disease outbreaks and flood-related injuries, on July 16, IDPH established an ad hoc surveillance system employing 17 outpatient facilities to monitor the daily number of visits for diarrheal illnesses and flood-related injuries (i.e., heat, musculoskeletal, puncture/laceration, head, animal bite, poisoning, and electrical). As of August 6, when this surveillance was discontinued, no outbreaks of waterborne diseases were identified. In addition to one death from electrocution, five nonfatal cases of carbon monoxide poisoning were reported.

The entomology department at Iowa State University and the University State Hygienic Laboratory at the University of Iowa have maintained an ongoing statewide arbovirus surveillance program since 1968. Mosquitoes are collected daily from New Jersey traps in six major Iowa cities. Carbon dioxide-baited CDC light traps are used periodically to monitor virus activity in vector populations in these cities, and sentinel chicken flocks are located in eastern, western, and central Iowa. On July 14, populations of *Culex tarsalis*, an important vector of western equine encephalitis, were at extremely high levels (176 *Cx. tarsalis* per carbon dioxide-baited trap per night) in western Iowa. *Cx. tarsalis* populations also were increased above baseline in the eastern part of the state. However, as of August 19, seroconversions had not been detected in sentinel chicken flocks.

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Editorial Note: Flooding is the most common type of natural disaster worldwide, accounting for an estimated 40% of all natural disasters (*1*). In riverine flooding, water levels can rise to flood stage gradually or very rapidly (i.e., flash flood) from snow melt or heavy or repeated rains. During the 1993 midwestern flood disaster, both gradual and flash flooding occurred.

Flash flooding is the leading cause of weather-related mortality in the United States (accounting for approximately 200 deaths per year) (*1*). However, the public health impact of floods also includes damage or destruction to homes and displacement of the occupants that may, in turn, facilitate the spread of some infectious diseases because of crowded living conditions and compromised personal hygiene (i.e., hand washing). Stress-related mental health or substance-abuse problems may be associated with flood disasters (*1,2*). As the findings in this report indicate, medical and public health services may be interrupted in affected communities. Finally, the occurrence of injuries may increase during the clean-up phase of a disaster (*3*).

The multiple environmental consequences of flooding can directly affect the public's health. For example, water sources can become contaminated with fecal material or toxic chemicals, water or sewer systems can be disrupted, dangerous substances can be released (e.g., propane from damaged storage tanks), and solid-waste collection and disposal can be disrupted. In addition, flooding can result in vector-associated problems, including increases in mosquito populations that, under certain circumstances, increase the risk for some mosquitoborne infectious diseases (e.g., viral encephalitis) (*4,5*).

Floods and other natural disasters often are followed by rumors of epidemics (e.g., typhoid, cholera, or rabies) (*6,7*) or unusual conditions such as increased snake or dog bites. Such unsubstantiated reports can gain public credibility when printed in newspapers or reported on television or radio as facts. The potential for such rumors underscores the need for valid and systematically collected data and the importance of basic public health surveillance in such settings. Elements to be considered in such surveillance efforts are described in the CDC publication *Beyond the Flood: A Prevention Guide for Personal Health and Safety* (*8*), which emphasizes the importance of 1) purification of drinking and cooking water; 2) disinfection of wells; 3) food safety (i.e., handling of food that may have come in contact with flood water or of refrigerated food after the interruption of electrical power); 4) sanitation and personal hygiene; 5) injury-prevention measures to be taken during the return to and cleaning up of flooded homes; 6) communicable diseases and vaccinations; 7) mosquito control; and 8) other hazards such as animals, chemicals, and swift-flowing water. Copies of the guide are available from state health departments.

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Tuberculosis in Philippine National World War II Veterans Immigrating to Hawaii, 1992–1993

The Immigration Act of 1990* allows World War II veterans who are Philippine nationals to be naturalized as U.S. citizens and to enter the United States without any medical screening or restrictions. Following the diagnosis of tuberculosis (TB) in February 1992 in a Philippine national veteran who had recently arrived in Hawaii, the Hawaii Department of Health (HDOH) initiated efforts to assist veterans who had already arrived in Hawaii to receive TB testing and appropriate treatment and monitoring. This report describes the first case of TB identified in a veteran who entered Hawaii from the Philippines under this act and summarizes efforts by HDOH to detect and treat TB among Philippine national veterans.

In February 1992, because of a requirement for food-handling jobs, a 72-year-old man visited the TB health center in Honolulu to be evaluated and obtain a certificate stating he did not have active TB.† At the time of this visit, he was asymptomatic but had a positive purified protein derivative (PPD) skin test, a chest radiograph with multiple cavitary lesions, and sputum smears with acid-fast bacilli (AFB). Sputum cultures were positive for *Mycobacterium tuberculosis*. The patient reported he had recently arrived in Hawaii as a World War II veteran from the Philippines.

Consultation with the Immigration and Naturalization Service indicated that as many as 60,000 Philippine national veterans could be eligible for naturalization as U.S. citizens under the Immigration Act of 1990. The overall occurrence of TB in the Philippines is substantial: during 1990, the most recent year for which reliable data are available, 180,683 TB cases were reported, for an incidence rate of 289 cases per 100,000 population (*1*).Therefore, in March 1992, HDOH initiated efforts to directly contact, for providing screening, diagnosis, and treatment or prophylaxis for TB, all Philippine national World War II veterans who had already arrived in Hawaii. In addition, HDOH worked with CDC staff at the Honolulu International Airport to provide an information brochure to arriving veterans encouraging them to visit HDOH facilities for a free TB evaluation.

*Public Law 101-649.
†State law (§11-164-7) in Hawaii requires that food handlers receive a health certificate indicating they do not have active TB before they can work in restaurants.

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Based on these efforts, 1659 (80.2%) of 2069 veterans (age range: 62–79 years) who had arrived in Hawaii from February 1992 through March 1993 were evaluated by HDOH. Chest radiographs and PPD skin tests were performed for 1580 (95.2%) veterans; 1425 veterans had their tests read (155 did not return for reading). Of those with skin-test readings, 996 (69.9%) showed a significant (≥10 mm induration) reaction to a two-step Mantoux skin test.

Of the 996 persons who were skin-test positive, 450 (45.2%) had abnormal chest radiographs. Of these, 106 persons had clinical and/or radiographic evidence of active TB. Of sputum samples obtained from 69 patients, *M. tuberculosis* was isolated from 65; for 22 (33.8%) of these patients, sputum samples were smear positive for AFB. Each of the 106 veterans with evidence of active TB was placed on four-drug therapy consisting of isoniazid (INH), rifampin (RIF), pyrazinamide, and ethambutol. Sixteen veterans were hospitalized for treatment. Of the 65 isolates, 12 were resistant to some drugs: eight were resistant to INH, and four were resistant to at least INH and RIF.

Preventive therapy was initiated for 195 (43.3%) of the 450 veterans with abnormal chest radiographs because their chest radiographs were consistent with previous, healed TB, with or without additional medical conditions that warranted preventive therapy. Of these, 98 veterans completed preventive treatment, and 97 are still undergoing treatment. Twenty-one considered to have inactive TB did not receive medication.

Of the 546 veterans who were skin-test positive with a normal chest radiograph, preventive therapy was initiated for 39; 51 were referred to their private physician for follow-up and treatment as indicated.

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Editorial Note: The findings of this investigation indicate the need for a reliable approach for screening, diagnosing, and treating TB in Philippine national World War II veterans who apply for naturalization under provisions of the Immigration Act of 1990. The detection of drug-resistant TB in some of the veterans underscores this need.

This group of Philippine national veterans is an exception to the medical screening requirements of the Immigration Act: all other applicants for immigrant visas are required to receive medical screening—which includes an examination for TB—as part of the visa application process, and all other immigrants are required to reside in the United States for at least 5 years before they can be naturalized. In contrast, other groups of foreign nationals—including parolees, asylees, students and their families, and several categories of workers—-are permitted to enter the United States for prolonged residence without medical screening. Many of these persons enter from areas with a high prevalence of TB; however, the impact of TB among these persons on the overall epidemiology of TB in the United States is unknown because none of these groups have been systematically screened after their entry into the United States. The Advisory Council for the Elimination of Tuberculosis recommends that special efforts be made to screen foreign-born persons from countries with a high prevalence of TB (*2,3*).

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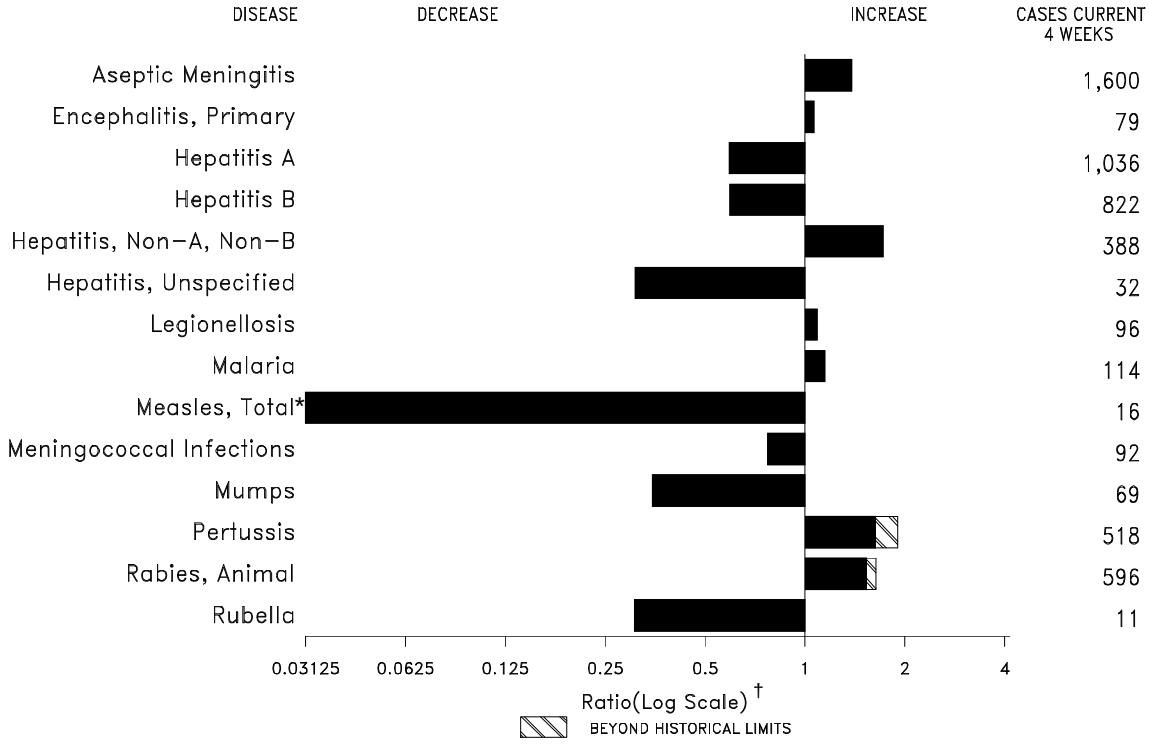
FIGURE I. Notifiable disease reports, comparison of 4-week totals ending August 28, 1993, with historical data — United States



* The large apparent decrease in reported cases of measles(total) reflects dramatic fluctuations in the historical baseline. (Ratio (log scale) for week thirty-four is 0.02671).

† 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 August 28, 1993 (34th Week)

	Cum. 1993		Cum. 1993
AIDS*	67,732	Measles: imported	31
Anthrax	-	indigenous	195
Botulism: Foodborne	8	Plague	7
Infant	28	Poliomyelitis, Paralytic§	-
Other	2	Psittacosis	38
Brucellosis	62	Rabies, human	1
Cholera	15	Syphilis, primary & secondary	16,749
Congenital rubella syndrome	7	Syphilis, congenital, age < 1 year¶	677
Diphtheria	-	Tetanus	26
Encephalitis, post-infectious	111	Toxic shock syndrome	164
Gonorrhea	248,392	Trichinosis	9
Haemophilus influenzae (invasive disease)†	801	Tuberculosis	13,470
Hansen Disease	112	Tularemia	89
Leptospirosis	25	Typhoid fever	208
Lyme Disease	4,189	Typhus fever, tickborne (RMSF)	272

*Updated monthly; last update July 31, 1993.
†Of 742 cases of known age, 244 (33%) 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 first quarter of 1993.

TABLE II. Cases of selected notifiable diseases, United States, weeks ending August 28, 1993, and August 22, 1992 (34th Week)

Reporting Area	AIDS*	Aseptic Meningitis	Encephalitis		Gonorrhea		Hepatitis (Viral), by type				Legionellosis	Lyme Disease
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	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	67,732	6,552	435	111	248,392	319,602	13,661	7,954	3,105	391	750	4,189
NEW ENGLAND	3,232	176	11	5	5,340	6,716	310	359	338	9	32	1,118
Maine	94	24	1	-	55	64	12	9	4	-	4	6
N.H.	67	24	-	2	43	80	16	57	264	2	1	36
Vt.	14	22	3	-	17	17	3	7	2	-	-	4
Mass.	1,818	77	5	3	1,923	2,444	157	226	61	7	23	120
R.I.	219	29	2	-	265	479	58	16	7	-	4	171
Conn.	1,020	-	-	-	3,037	3,632	64	44	-	-	-	781
MID. ATLANTIC	15,598	470	37	7	29,329	34,887	714	926	225	4	152	2,224
Upstate N.Y.	2,373	234	25	4	5,248	6,947	234	274	139	1	49	1,211
N.Y. City	8,289	104	1	-	7,880	12,143	177	121	1	-	3	3
N.J.	2,991	-	-	-	5,030	4,973	207	269	58	-	24	514
Pa.	1,945	132	11	3	11,171	10,824	96	262	27	3	76	496
E.N. CENTRAL	5,419	976	115	20	47,702	59,159	1,507	962	434	10	202	39
Ohio	938	367	39	4	14,896	18,069	197	140	32	-	106	20
Ind.	634	130	14	8	5,057	5,666	476	149	8	1	38	8
Ill.	1,939	172	23	2	13,208	18,905	382	164	40	3	10	5
Mich.	1,379	278	29	6	10,874	13,718	138	287	322	6	40	6
Wis.	529	29	10	-	3,667	2,801	314	222	32	-	8	-
W.N. CENTRAL	2,428	396	18	-	12,768	17,113	1,588	410	101	10	49	104
Minn.	511	61	7	-	1,657	1,877	295	46	3	4	1	52
Iowa	141	69	1	-	602	1,066	35	17	7	1	7	7
Mo.	1,374	108	-	-	7,274	9,587	989	289	70	5	12	7
N. Dak.	1	10	3	-	38	55	60	-	-	-	1	2
S. Dak.	22	14	5	-	179	117	13	-	-	-	-	-
Nebr.	135	7	-	-	476	1,117	135	11	8	-	23	4
Kans.	244	127	2	-	2,542	3,294	61	47	13	-	5	32
S. ATLANTIC	14,279	1,554	84	49	66,769	97,955	822	1,522	433	50	136	560
Del.	253	42	3	-	919	1,140	8	113	87	-	10	268
Md.	1,630	155	19	-	10,629	10,113	117	187	9	5	32	107
D.C.	896	27	-	-	3,131	4,328	6	33	-	-	13	2
Va.	1,049	171	28	6	7,988	11,023	96	94	22	20	4	47
W. Va.	46	17	19	-	404	587	11	28	19	-	1	9
N.C.	790	144	13	-	16,774	16,241	44	213	51	-	17	64
S.C.	933	21	-	-	7,042	7,260	11	35	3	1	13	7
Ga.	1,854	107	1	-	4,660	29,315	66	138	72	-	26	29
Fla.	6,828	870	1	43	15,222	17,948	463	681	170	24	20	27
E.S. CENTRAL	1,796	428	17	7	28,741	30,417	168	837	596	1	32	13
Ky.	213	165	7	6	3,100	3,162	79	59	10	-	12	3
Tenn.	731	96	5	-	8,645	10,043	34	702	572	-	13	8
Ala.	531	115	1	-	10,345	9,695	36	71	4	1	2	2
Miss.	321	52	4	1	6,651	7,517	19	5	10	-	5	-
W.S. CENTRAL	6,957	713	32	2	29,253	35,478	1,317	1,044	195	117	20	33
Ark.	267	39	1	-	5,683	5,072	35	36	2	2	2	1
La.	921	52	3	-	7,711	10,109	52	138	73	3	2	1
Okla.	590	1	7	-	2,233	3,522	106	198	78	8	11	17
Tex.	5,179	621	21	2	13,626	16,775	1,124	672	42	104	5	14
MOUNTAIN	2,948	407	17	4	7,107	7,965	2,688	389	217	57	52	17
Mont.	22	-	-	1	53	70	58	4	2	-	5	-
Idaho	52	7	-	-	112	72	128	34	-	1	1	2
Wyo.	31	5	-	-	60	35	12	20	71	-	5	8
Colo.	985	116	7	-	2,195	2,867	645	50	36	33	6	-
N. Mex.	240	78	3	2	605	587	253	144	66	2	3	1
Ariz.	992	131	5	-	2,659	2,782	968	62	10	9	10	-
Utah	197	25	1	-	225	198	549	39	24	11	7	2
Nev.	429	45	1	1	1,198	1,354	75	36	8	1	15	4
PACIFIC	15,075	1,432	104	17	21,383	29,912	4,547	1,505	566	133	75	81
Wash.	1,008	-	1	-	2,513	2,619	509	146	128	8	9	3
Oreg.	575	-	-	-	1,100	1,120	65	23	11	-	-	2
Calif.	13,233	1,335	99	17	17,055	25,402	3,391	1,310	416	122	59	75
Alaska	47	15	3	-	356	467	525	8	9	-	-	-
Hawaii	212	82	1	-	359	304	57	18	2	3	7	1
Guam	-	2	-	-	38	48	2	2	-	1	-	-
P.R.	1,950	37	-	-	336	140	56	254	46	2	-	-
V.I.	34	-	-	-	76	69	-	4	-	-	-	-
Amer. Samoa	-	-	-	-	35	30	13	-	-	-	-	-
C.N.M.I.	-	2	-	-	57	59	-	1	-	1	-	-

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

*Updated monthly; last update July 31, 1993.

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending August 28, 1993, and August 22, 1992 (34th Week)

UNITED STATES	712	4	195	-	31	2,112	1,650	20	1,116	109	2,599	1,480	3	144	131
NEW ENGLAND	52	1	56	-	4	55	94	-	8	3	490	117	-	1	6
Maine	1	1	2	-	-	3	5	-	-	2	13	5	-	1	1
N.H.	6	U	1	U	-	13	12	U	-	U	214	30	U	-	-
Vt.	1	-	30	-	1	-	4	-	-	-	55	4	-	-	-
Mass.	25	-	14	-	2	14	53	-	2	1	161	52	-	-	-
R.I.	2	-	-	-	1	21	1	-	2	-	6	-	-	-	4
Conn.	17	-	9	-	-	4	19	-	4	-	41	26	-	-	1
MID. ATLANTIC	111	-	7	-	3	201	197	1	87	17	310	69	-	41	10
Upstate N.Y.	40	-	-	-	1	111	89	1	32	11	130	35	-	8	7
N.Y. City	24	-	2	-	-	54	19	-	-	-	7	9	-	15	-
N.J.	31	-	5	-	2	36	31	-	8	-	35	25	-	13	3

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending August 28, 1993, and August 22, 1992 (34th 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	16,749	22,219	164	13,470	14,561	89	208	272	5,572
NEW ENGLAND	267	433	10	307	265	-	17	3	946
Maine	3	2	2	23	18	-	-	-	-
N.H.	25	29	2	9	3	-	1	-	58
Vt.	1	1	1	3	4	-	-	-	19
Mass.	101	218	4	162	128	-	11	3	374
R.I.	11	21	1	36	23	-	-	-	-
Conn.	126	162	-	74	89	-	5	-	495
MID. ATLANTIC	1,549	3,193	28	3,124	3,511	1	46	22	2,163
Upstate N.Y.	135	238	15	314	435	1	9	4	1,674
N.Y. City	796	1,788	1	1,860	2,069	-	26	-	-
N.J.	214	410	-	496	590	-	8	10	279
Pa.	404	757	12	454	417	-	3	8	210
E.N. CENTRAL	2,495	3,264	41	1,278	1,425	4	25	11	68
Ohio	764	514	19	211	216	1	6	7	5
Ind.	212	175	1	137	108	1	1	1	5
Ill.	821	1,429	5	580	724	1	13	1	12
Mich.	412	637	16	289	315	1	4	2	9
Wis.	286	509	-	61	62	-	1	-	37
W.N. CENTRAL	1,054	922	10	318	354	30	2	14	242
Minn.	51	57	2	38	99	-	-	1	34
Iowa	32	35	5	37	25	-	-	4	42
Mo.	864	715	-	171	161	12	2	6	9
N. Dak.	1	1	-	5	5	-	-	-	50
S. Dak.	1	-	-	11	14	14	-	2	32
Nebr.	10	21	-	14	16	1	-	-	7
Kans.	95	93	3	42	34	3	-	1	68
S. ATLANTIC	4,554	6,160	21	2,334	2,659	2	29	127	1,350
Del.	83	139	1	30	31	-	1	1	108
Md.	260	436	1	251	216	-	6	9	397
D.C.	243	285	-	115	84	-	-	-	13
Va.	431	506	6	281	195	-	3	8	250
W. Va.	9	13	-	53	63	-	-	5	59
N.C.	1,282	1,603	3	328	330	1	1	67	60
S.C.	664	850	-	272	267	-	-	9	108
Ga.	757	1,220	2	508	588	-	1	22	313
Fla.	825	1,108	8	496	885	1	17	6	42
E.S. CENTRAL	2,564	2,816	8	873	934	4	4	29	78
Ky.	216	96	2	250	256	-	1	5	11
Tenn.	731	792	3	144	244	3	1	15	-
Ala.	555	1,006	2	318	262	1	2	3	67
Miss.	1,062	922	1	161	172	-	-	6	-
W.S. CENTRAL	3,530	3,909	2	1,471	1,601	34	2	57	377
Ark.	540	591	-	120	111	19	-	1	28
La.	1,657	1,643	-	-	138	-	1	1	5
Okla.	270	195	2	171	110	12	-	53	55
Tex.	1,063	1,480	-	1,180	1,242	3	1	2	289
MOUNTAIN	161	246	9	330	374	9	8	9	123
Mont.	1	7	-	15	-	5	-	1	16
Idaho	-	1	1	8	15	-	-	-	5
Wyo.	7	3	-	2	-	2	-	7	16
Colo.	41	37	2	32	30	-	5	1	19
N. Mex.	24	27	-	35	52	1	1	-	6
Ariz.	72	123	1	148	172	-	2	-	48
Utah	4	7	4	19	51	1	-	-	4
Nev.	12	41	1	71	54	-	-	-	9
PACIFIC	575	1,276	35	3,435	3,438	5	75	-	225
Wash.	37	64	6	162	197	1	4	-	-
Oreg.	51	28	-	77	87	2	-	-	-
Calif.	478	1,175	29	2,984	2,947	2	68	-	208
Alaska	6	4	-	35	45	-	-	-	17
Hawaii	3	5	-	177	162	-	3	-	-
Guam	1	3	-	28	54	-	-	-	-
P.R.	356	209	-	152	135	-	-	-	29
V.I.	32	45	-	2	3	-	-	-	-
Amer. Samoa	-	-	-	2	-	-	-	-	-
C.N.M.I.	3	5	-	19	42	-	-	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,* week ending August 28, 1993 (34th Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	605	418	95	64	18	9	48
Boston, Mass.	191	117	34	25	12	2	17
Bridgeport, Conn.	49	34	8	6	-	1	-
Cambridge, Mass.	25	20	3	2	-	-	1
Fall River, Mass.	26	24	2	-	-	-	-
Hartford, Conn.	30	18	6	4	2	-	1
Lowell, Mass.	21	15	3	1	1	1	3
Lynn, Mass.	11	9	1	1	-	-	-
New Bedford, Mass.	20	15	2	3	-	-	3
New Haven, Conn.	26	17	5	3	1	-	1
Providence, R.I.	56	35	11	8	1	1	10
Somerville, Mass.	8	4	1	3	-	-	-
Springfield, Mass.	55	42	7	4	-	2	6
Waterbury, Conn.	27	19	5	1	1	1	2
Worcester, Mass.	60	49	7	3	-	1	4
MID. ATLANTIC	2,178	1,402	419	259	48	50	81
Albany, N.Y.	34	22	7	3	2	-	4
Allentown, Pa.	23	21	1	1	-	-	1
Buffalo, N.Y.	100	61	27	8	2	2	3
Camden, N.J.	36	25	4	3	1	3	2
Elizabeth, N.J.	17	9	6	2	-	-	-
Erie, Pa.§	35	27	7	1	-	-	5
Jersey City, N.J.	57	37	14	6	-	-	-
New York City, N.Y.	1,227	755	235	187	27	23	34
Newark, N.J.	42	24	7	9	2	-	2
Paterson, N.J.	31	17	10	1	-	3	-
Philadelphia, Pa.	194	135	34	18	4	3	13
Pittsburgh, Pa.§	68	46	5	8	1	8	8
Reading, Pa.	11	9	-	1	1	-	-
Rochester, N.Y.	113	81	23	2	4	3	2
Schenectady, N.Y.	20	15	5	-	-	-	1
Scranton, Pa.§	29	22	3	2	2	-	1
Syracuse, N.Y.	76	51	16	3	1	5	3
Trenton, N.J.	48	34	11	2	1	-	2
Utica, N.Y.	17	11	4	2	-	-	-
Yonkers, N.Y.	U	U	U	U	U	U	U
E.N. CENTRAL	2,131	1,301	405	228	140	57	93
Akron, Ohio	57	43	9	2	-	3	-
Canton, Ohio	24	16	4	2	2	-	5
Chicago, Ill.	525	213	106	104	93	9	14
Cincinnati, Ohio	97	59	28	6	1	3	5
Cleveland, Ohio	139	93	24	13	4	5	1
Columbus, Ohio	192	120	42	19	4	7	16
Dayton, Ohio	108	80	13	11	4	-	2
Detroit, Mich.	209	122	50	22	9	6	7
Evansville, Ind.	50	39	9	1	1	-	2
Fort Wayne, Ind.	55	34	11	6	1	3	2
Gary, Ind.	17	9	4	1	1	2	-
Grand Rapids, Mich.	58	37	13	3	4	1	5
Indianapolis, Ind.	151	108	18	14	3	8	8
Madison, Wis.	36	22	4	5	2	3	3
Milwaukee, Wis.	116	83	19	9	2	3	4
Peoria, Ill.	51	37	10	2	2	-	2
Rockford, Ill.	49	33	10	2	2	2	4
South Bend, Ind.	43	36	5	2	-	-	3
Toledo, Ohio	118	88	20	4	4	2	9
Youngstown, Ohio	36	29	6	-	1	-	1
W.N. CENTRAL	790	551	124	67	23	25	43
Des Moines, Iowa	98	71	13	6	3	5	12
Duluth, Minn.	35	25	6	2	2	-	2
Kansas City, Kans.	23	19	3	1	-	-	1
Kansas City, Mo.	107	77	13	9	4	4	4
Lincoln, Nebr.	43	32	4	5	1	1	-
Minneapolis, Minn.	168	120	29	10	3	6	8
Omaha, Nebr.	100	63	22	8	3	4	3
St. Louis, Mo.	109	67	16	17	5	4	4
St. Paul, Minn.	50	39	5	5	1	-	8
Wichita, Kans.	57	38	13	4	1	1	1

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
S. ATLANTIC	1,003	627	207	110	36	23	46
Atlanta, Ga.	166	94	49	18	5	-	1
Baltimore, Md.	190	112	41	24	7	6	16
Charlotte, N.C.	82	52	16	11	2	1	3
Jacksonville, Fla.	112	72	20	13	4	3	4
Miami, Fla.	104	62	17	16	7	2	-
Norfolk, Va.	33	19	6	5	3	-	3
Richmond, Va.	62	41	12	7	2	-	1
Savannah, Ga.	61	39	13	3	2	4	4
St. Petersburg, Fla.	53	39	7	3	1	3	3
Tampa, Fla.	119	84	22	6	3	4	11
Washington, D.C.	U	U	U	U	U	U	U
Wilmington, Del.	21	13	4	4	-	-	-
E.S. CENTRAL	732	458	157	68	27	21	46
Birmingham, Ala.	110	75	20	9	2	4	2
Chattanooga, Tenn.	54	28	12	7	5	2	2
Knoxville, Tenn.	68	41	20	4	3	-	8
Lexington, Ky.	60	38	13	4	2	3	4
Memphis, Tenn.	188	125	35	24	3	1	19
Mobile, Ala.	64	35	16	8	1	4	5
Montgomery, Ala.	46	31	8	2	3	2	1
Nashville, Tenn.	142	85	33	10	8	5	5
W.S. CENTRAL	1,350	841	280	148	48	30	58
Austin, Tex.	72	44	11	12	4	1	3
Baton Rouge, La.	38	29	5	2	2	-	-
Corpus Christi, Tex.	62	43	12	6	1	-	2
Dallas, Tex.	225	121	52	34	9	9	1
El Paso, Tex.	54	36	11	6	1	-	3
Ft. Worth, Tex.	74	39	27	6	1	1	1
Houston, Tex.	266	167	55	31	8	5	29
Little Rock, Ark.	63	44	10	6	-	3	5
New Orleans, La.	110	54	26	13	9	5	-
San Antonio, Tex.	228	150	42	21	10	5	10
Shreveport, La.	45	24	11	7	2	1	3
Tulsa, Okla.	113	90	18	4	1	-	1
MOUNTAIN	761	458	165	87	30	21	38
Albuquerque, N.M.	74	51	12	6	3	2	4
Colo. Springs, Colo.	50	30	12	4	2	2	2
Denver, Colo.	113	74	18	12	3	6	2
Las Vegas, Nev.	85	35	28	15	6	1	4
Ogden, Utah	16	10	4	1	1	-	-
Phoenix, Ariz.	187	113	37	20	9	8	12
Pueblo, Colo.	25	19	5	-	1	-	-
Salt Lake City, Utah	105	64	20	17	3	1	7
Tucson, Ariz.	106	62	29	12	2	1	7
PACIFIC	1,858	1,187	363	193	64	38	108
Berkeley, Calif.	21	12	6	2	-	1	2
Fresno, Calif.	76	51	8	8	4	5	6
Glendale, Calif.	21	14	4	2	1	-	2
Honolulu, Hawaii	98	68	18	8	3	1	8
Long Beach, Calif.	68	47	14	1	4	2	8
Los Angeles, Calif.	515	305	96	75	23	5	17
Pasadena, Calif.	26	21	1	1	2	1	-
Portland, Oreg.	121	89	18	9	1	4	4
Sacramento, Calif.	128	74	35	10	5	4	6
San Diego, Calif.	161	99	42	16	2	2	21
San Francisco, Calif.	144	84	33	19	3	3	3
San Jose, Calif.	155	103	29	19	4	-	16
Santa Cruz, Calif.	34	27	5	2	-	-	2
Seattle, Wash.	152	90	31	20	5	6	1
Spokane, Wash.	47	34	7	-	3	3	9
Tacoma, Wash.	91	69	16	1	4	1	3
TOTAL	11,408¶	7,243	2,215	1,224	434	274	561

*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.

Tuberculosis — Continued

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State-Specific Changes in Cholesterol Screening — Behavioral Risk Factor Surveillance System, 1988–1991

High blood cholesterol (HBC) is an important risk factor for coronary heart disease (*1*)—the leading cause of death in the United States. To reduce the prevalence of elevated cholesterol levels in the United States, in 1985 the National Heart, Lung, and Blood Institute initiated the National Cholesterol Education Program (NCEP). The NCEP recommends that all adults aged ≥20 years be screened for HBC at least once every 5 years. One of the national health objectives for the year 2000 is to increase to 75% the percentage of adults screened for HBC within the preceding 5 years (objective 15.14) (*2*). To measure progress toward this objective, data from CDC's Behavioral Risk Factor Surveillance System (BRFSS) were used to examine state-specific trends in cholesterol screening from 1988 through 1991. This report summarizes the results of this analysis and provides a projected estimate of the 1994 screening rates for HBC in each state.

Data were available for 258,782 persons aged ≥20 years in 47 states and the District of Columbia who participated in the BRFSS, a population-based, random-digit–dialed telephone survey. However, only 37 states participated continuously for all 4 years. Respondents were asked whether they had ever had their cholesterol checked, and if so, the length of time that had elapsed since they last had their cholesterol checked. Persons who reported that they had been screened within the preceding 5 years were classified as having been screened for HBC. Data were weighted to account for the age, race, and sex distribution in each state. To allow for comparisons between states, the results were standardized for age, race, sex, and level of education and adjusted to the 1980 U.S. population. Confidence intervals for the prevalence estimates were calculated using SESUDAAN (*3*).

A state-specific method and an aggregate method were used to project the prevalence of cholesterol screening in 1994. The analysis in the state-specific method was limited to the 37 states that participated in the BRFSS from 1988 through 1991; for each state, the 3-year change in the percentage of adults screened for HBC during 1988–1991 was added to that state's 1991 value to project the 1994 screening rate. The analysis in the aggregate method employed the median 3-year change in cholesterol screening from 1988 through 1991 from the 37 states that participated in the BRFSS; the median 3-year change was then added to the state-specific 1991 cholesterol screening value for each of the 48 states.

In the 37 states that participated in the BRFSS from 1988 through 1991, the percentage of adults screened for HBC increased from 51.2% to 63.9% (Table 1). The

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estimated state-specific 3-year change in the rate of cholesterol screening ranged from a 2.0% increase in Hawaii to a 21.4% increase in New Mexico (median: 12.7%). Based on the state-specific method of analysis, the projected screening rates for 1994 ranged from 63.6% (Illinois) to 86.4% (Connecticut); 20 (54.1%) of the 37 states have projected 1994 screening rates greater than the national year 2000 objective of 75%.

Based on the median increase of 12.7%, the projected screening rates for 1994 ranged from 69.7% (New Mexico) to 82.2% (New Jersey). Using this method, 32 (66.7%) of the 48 states would reach the national year 2000 objective by 1994 (Figure 1).

Reported by the following BRFSS coordinators: L Eldridge, Alabama; P Owen, Alaska; J Contreras, Arizona; J Senner, Arkansas; L Lund, California; M Leff, Colorado; M Adams, Connecticut; F Breukelman, Delaware; C Mitchell, District of Columbia; D McTague, EPledger, Florida; VF Ah Cook, Hawaii; J Mitten, Idaho; B Steiner, Illinois; R Guest, Indiana; S Schoon, Iowa; K Bramblett, Kentucky; S Kirkconnell, Louisiana; R Schwartz, Maine; A Weinstein, Maryland; R Lederman, Massachusetts; H McGee, Michigan; N Salem, Minnesota; E Jones, Mississippi; J Jackson-Thompson, Missouri; P Smith, Montana; S Huffman, Nebraska; K Zaso, New Hampshire; G Boeselager, New Jersey; L Pendley, New Mexico; C Baker, New York; CR Washington, North Carolina; M Maetzold, North Dakota; E Capwell, Ohio; N Hann, Oklahoma; J Grant-Worley, Oregon; C Becker, Pennsylvania; J Buechner, Rhode Island; M Lane, South Carolina; B Miller, South Dakota; D Ridings, Tennessee; R Diamond, Texas; R Giles, Utah; P Brozicevic, Vermont; R Schaeffer, Virginia; T Jennings, Washington; F King, West Virginia; E Cautley, Wisconsin. P Remington, MD, Bur of Public Health, Div of Health, Wisconsin Dept of Health and Social Svcs. Cardiovascular Health Br, Div of Chronic Disease Control and Community Intervention, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: For persons with cholesterol levels in the highest 10% of the U.S. population, the risk of dying from coronary heart disease is approximately fourfold greater than that for persons with levels in the lowest 10% (*4*). Based on NCEP guidelines, approximately 29% of U.S. adults need treatment for HBC (*5*).

The findings in this report indicate substantial increases in cholesterol screening from 1988 through 1991, representing an additional 19 million adults aged ≥20 years who have been screened for HBC. This increase may be attributable to a variety of factors, including increased public interest in cholesterol, the increased quantity and quality of screening services (*6*), and educational efforts sponsored by public and private agencies.

Based on either the state-specific or aggregate trends methods of projection, if current trends continue, by 1994 populations in one half of the states will attain the national year 2000 objective for cholesterol screening. In addition, data from the third National Health and Nutrition Examination Survey, conducted from 1988 through 1991, indicate that the national year 2000 objectives for two other cholesterol-related health objectives—the prevalences of high blood cholesterol and mean cholesterol level (*7*)—are close to being achieved.

Screening is an important step in reducing the prevalence of elevated cholesterol levels. Other steps include increasing public awareness of the health risk associated with HBC, adopting appropriate dietary changes to reduce fat and cholesterol intake, reducing weight for persons who are overweight, and increasing physical activity (*8*). Periodic analysis of data from the BRFSS will assist in monitoring state-specific progress toward achieving the national year 2000 objectives for cholesterol screening and guiding the development of new objectives.

TABLE 1. State-specific changes in the percentage of adults who have had their cholesterol checked within the preceding 5 years — Behavioral Risk Factor Surveillance System, 1988–1991

State	1988*	1989†	1990§	1991¶	Change in screening rate, 1988–1991**	Projected 1994 screening rate based on the 1988–1991 state-specific increase††	Projected 1994 screening rate based on a 12.7% median increase§§
Alabama	47.3	48.0	56.5	63.9	16.6¶¶	80.5***	76.6***
Alaska	NA†††	NA	NA	62.4	NA	NA	75.1***
Arizona	51.7	55.7	56.1	62.4	10.7¶¶	73.1	75.1***
Arkansas	NA	NA	NA	58.5	NA	NA	
California	53.4	60.0	59.2	65.7	12.3¶¶	78.0***	78.4***
Colorado	NA	NA	60.4	62.1	NA	NA	74.8
Connecticut	51.4	62.1	65.4	68.9	17.5¶¶	86.4***	81.6***
Delaware	NA	NA	61.4	62.6	NA	NA	75.3***
District of Columbia	58.4	46.7	50.0	62.4	4.0	66.4	75.1***
Florida	51.2	56.1	62.2	67.7	16.5	84.2***	80.4***
Georgia	49.4	54.4	62.3	64.3	14.9¶¶	79.2***	77.0***
Hawaii	61.2	53.8	64.3	63.2	2.0	65.2	75.9***
Idaho	50.1	54.3	56.1	60.9	10.8¶¶	71.7	73.6
Illinois	51.6	55.9	59.1	57.6	6.0	63.6	70.3
Indiana	48.9	49.9	57.2	61.2	12.3¶¶	73.5	73.9
Iowa	51.7	55.4	62.8	64.6	12.9¶¶	77.5***	77.3***
Kentucky	47.6	52.5	54.6	59.4	11.8¶¶	71.2	72.1
Louisiana	NA	NA	62.0	61.7	NA	NA	74.4
Maine	55.9	57.8	64.5	64.5	8.6¶¶	73.1	77.2***
Maryland	54.2	63.3	64.0	66.8	12.6¶¶	79.4	79.5***
Massachusetts	52.2	59.1	64.2	66.8	14.6¶¶	81.4***	79.5***
Michigan	57.9	59.3	61.5	65.8	7.9¶¶	73.7	78.5***
Minnesota	52.2	57.9	61.4	65.1	12.9¶¶	78.0***	77.8***
Mississippi	NA	NA	51.7	59.1	NA	NA	71.8
Missouri	44.0	48.1	59.1	63.6	19.6¶¶	83.2**	76.3***
Montana	47.0	48.9	52.8	59.3	12.3¶¶	71.6	72.0

Nebraska	47.7	50.5	55.5	60.4	12.7¶¶	73.1	73.1
New Hampshire	54.0	56.6	58.5	69.0	15.0¶¶	84.0***	81.7***
New Jersey	NA	NA	NA	69.5	NA	NA	82.2***
New Mexico	35.6	47.4	54.3	57.0	21.4¶¶	78.4***	69.7
New York	51.8	52.5	63.5	66.1	14.3¶¶	80.4***	78.8***
North Carolina	54.9	55.2	64.7	67.5	12.6¶¶	80.1***	80.2***
North Dakota	50.1	53.7	62.2	62.1	12.0¶¶	74.1	74.8
Ohio	46.7	51.3	54.6	63.3	16.6¶¶	79.9***	76.0***
Oklahoma	51.0	52.5	63.0	64.6	13.6¶¶	78.2***	77.3***
Oregon	NA	58.6	61.8	64.8	NA	NA	77.5***
Pennsylvania	NA	55.2	58.8	62.6	NA	NA	75.3***
Rhode Island	51.2	59.5	67.3	68.1	16.9¶¶	85.0***	80.8***
South Carolina	52.8	58.3	63.2	66.1	13.3¶¶	79.4***	78.8***
South Dakota	45.6	51.8	51.9	61.7	16.1¶¶	77.8***	74.4
Tennessee	49.7	52.7	62.7	64.7	15.0¶¶	79.7***	77.4***
Texas	48.9	56.6	59.1	62.6	13.7¶¶	76.3***	75.3***
Utah	45.4	51.0	54.9	57.5	12.1¶¶	69.6	70.2
Vermont	NA	NA	62.6	67.0	NA	NA	79.7***
Virginia	NA	56.5	63.4	67.5	NA	NA	80.2***
Washington	56.2	61.7	63.4	68.9	12.7¶¶	81.6***	81.6***
West Virginia	48.2	49.6	59.1	61.7	13.5¶¶	75.2***	74.4
Wisconsin	49.1	56.1	61.1	61.8	12.7¶¶	74.5	74.5
No. of states meeting national health objective for year 2000	0	0	0	0	NA	20/37 (54%)	32/48 (67%)

*Sample sizes for individual states range from 609 to 3056 persons aged ≥20 years.
†Sample sizes for individual states range from 667 to 3180 persons aged ≥20 years.
§Sample sizes for individual states range from 727 to 3191 persons aged ≥20 years.
¶Sample sizes for individual states range from 670 to 3190 persons aged ≥20 years.
**1991 percentage minus 1988 percentage.
††Limited to the 37 states that collected cholesterol screening information from 1988 through 1991.
§§Aggregate increase is based on data from the 37 states that collected cholesterol screening information from 1988 through 1991.
¶¶Statistically significant increase from 1988 through 1991; $p<0.05$.
***Value meets the national year 2000 objective for cholesterol screening.
†††Not available.

Cholesterol Screening — Continued

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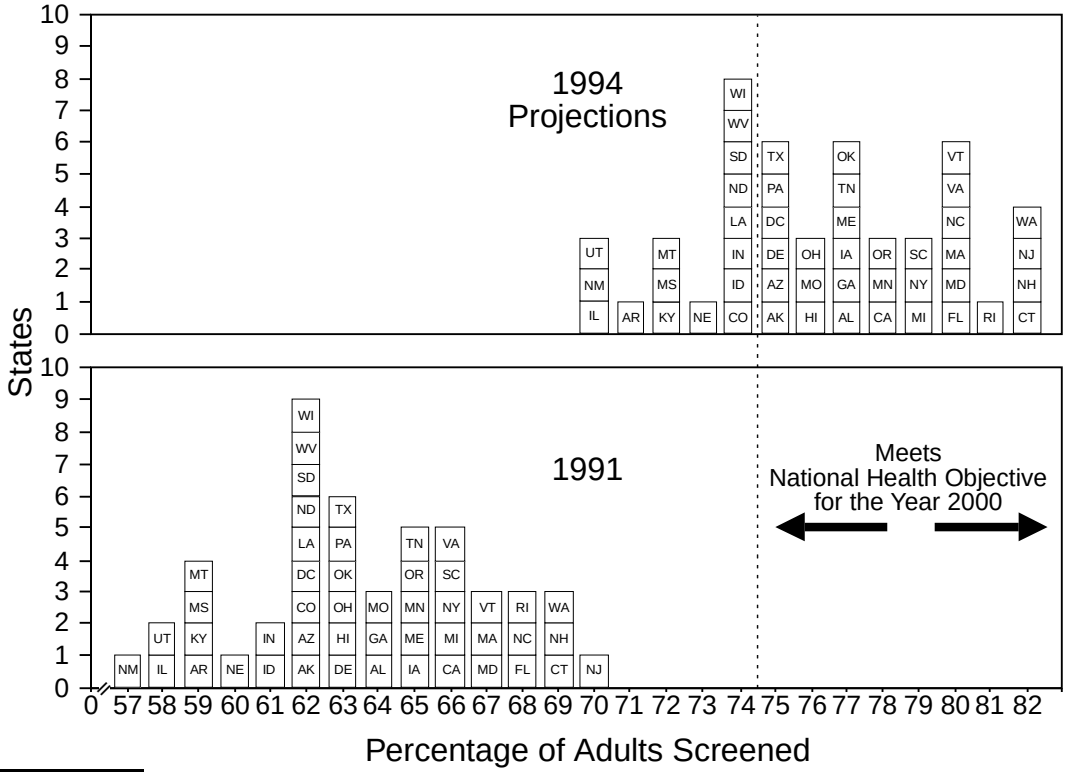
FIGURE 1. State-specific cholesterol screening rates for persons aged ≥20 years for 1991* and projected screening rates for 1994† — United States§



*Data are from the Behavioral Risk Factor Surveillance System.
†Projections assume a 12.7% increase in screening from 1991 through 1994.
§Forty-seven states and the District of Columbia.

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