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Behavioral Risk-Factor Surveillance — Selected States, 1984

During 1984, 15 states collected behavioral risk-factor surveillance (BRFS) data from their adult populations by monthly telephone interviews using random digit-dialing techniques. The interviews were conducted using standard questionnaires and procedures developed jointly by the state health departments and CDC. The data collected included seatbelt nonuse, hypertensive status, physical activity, overweight status, cigarette smoking, and alcohol misuse. The results presented here are based on 1 year of data collection and are weighted to take into account the age, race, and sex distribution of adults in each state, as well as the respondents' probability of selection (Table 1). These data represent the first year of routine surveillance of

TABLE 1. Behavioral risk-factor rates* in 15 states — United States, 1984

State	Overweight†	Sedentary lifestyle§	Uncontrolled hypertension¶	Current smoker**	Binge drinking††	Heavier drinking§§	Drinking & driving¶¶	Seatbelt nonuse***
Arizona	20.4	39.5	1.7	27.7	20.8	12.0	6.3	61.1
California	18.6	42.2	1.9	25.6	20.4	10.5	4.2	51.2
Idaho	21.8	46.3	2.1	24.5	17.8	5.8	4.2	71.0
Illinois	23.2	53.8	1.5	33.6	22.8	10.2	6.9	68.2
Indiana	23.7	53.7	2.5	†††	16.6	8.1	4.7	73.3
Minnesota	20.7	49.4	0.8	26.5	25.3	7.7	6.9	71.0
Montana	19.9	50.0	1.7	28.9	27.0	6.9	8.2	70.8
North Carolina	23.4	50.1	2.8	†††	14.2	6.8	4.6	71.3
Ohio	25.7	52.5	3.0	28.7	22.5	8.7	7.4	68.6
Rhode Island	19.2	59.9	2.4	31.3	19.2	8.6	5.0	71.4
South Carolina	21.9	54.9	1.8	26.2	11.0	5.7	2.0	66.6
Tennessee	21.4	60.9	1.6	†††	8.6	4.8	3.3	71.8
Utah	17.4	42.7	2.4	16.1	10.5	3.2	3.9	66.8
West Virginia	25.7	60.7	3.2	32.8	11.6	5.7	2.9	75.9
Wisconsin	24.6	50.4	1.5	27.4	28.9	10.3	11.3	67.9

*Percentages.

†One hundred twenty percent or more of ideal weight (ideal weight defined as the midvalue of the medium-framed person on the 1959 Metropolitan Life Insurance Company height/weight tables).

§Person with less than 20 minutes of leisure time physical activity at least three times per week.

¶Person who reports having been told by a medical professional that he/she is hypertensive and still has high blood pressure.

**Current cigarette smoker.

††Person who drank five or more drinks on an occasion one or more times in the past month.

§§Person whose average total alcoholic beverage intake exceeds 60 drinks per month.

¶¶Person who responded once or more to the question: ". . . during the past month, how many times have you driven when you've had perhaps too much to drink?"

***Person who states he/she sometimes, seldom, or never uses a seatbelt when riding in or driving a car.

†††Data not available.

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Behavioral Risk-Factor Surveillance – Continued

behavioral risk factors in the states. The data allow state health departments to compare the prevalence of risk behaviors associated with the 10 leading causes of premature death among adults in their state with adults in other states. These data will be used to monitor trends and to monitor statewide programs to reduce the prevalence of these behaviors.

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Editorial Note: State-specific estimates of behavioral risk factors from prior years have been previously reported (*1-4*). There are differences between this report and previous data. "Acute drinking" in previous reports is now entitled "binge drinking"; "chronic heavier drinking" in previous reports is now entitled "heavier drinking"; "sedentary lifestyle" in this report is computed by a revised algorithm (see footnotes); and "lack of seatbelt use" in previous reports is now entitled "seatbelt nonuse" and is now computed from different response categories. Direct comparisons can be made with the previous reports with the exception of "sedentary lifestyles" and "seatbelt nonuse."

References

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Epidemiologic Notes and Reports

Aldicarb Food Poisoning from Contaminated Melons – California

At 4 a.m., July 4, 1985, three adults who ate a solid green watermelon purchased in Oakland, California, had rapid onset of nausea, vomiting, diarrhea, profuse sweating, excessive tearing, muscle fasciculations, and bradycardia. The most severely ill was a 59-year-old woman who had been receiving digoxin and who, on examination, had a heart rate of 32 and 4-second periods of asystole. The treating physician diagnosed cholinesterase-inhibitor poisoning, and the patient responded rapidly to atropine. The California Department of Health Services (CDHS) had been alerted the day before by Oregon State Health Division officials of

Aldicarb Food Poisoning — Continued

similar, although milder, clusters of illness in Oregon associated with ingestion of striped watermelons, possibly of California origin. CDHS notified the San Francisco Bay Area Regional Poison Control Center to be alert for watermelon-associated illness. When the attending physician consulted the Poison Control Center, CDHS was alerted to the outbreak in California.

CDHS contacted 10 California poison-control centers, 20 selected emergency rooms, and a county health department and identified 12 additional cases in different areas of the state. Later on July 4, Oregon officials reported that aldicarb sulfoxide (ASO) had been detected in several melons associated with similar illnesses. ASO is the primary toxic metabolite of aldicarb (Temik®), a systemic pesticide not registered in the United States for use on watermelons. In the melon associated with the index cases in California, ASO was found at 2.7 parts per million.

At 1 p.m. that same day, CDHS ordered an immediate statewide embargo on watermelon sales and issued state media advisories recommending that persons refrain from eating watermelons. Because watermelons had become so intermingled in the distribution chain, melons harvested in fields thought to be contaminated could not be separated from other melons. Therefore, on July 7, it was decided to destroy all watermelons in the California distribution chain.

Between July 4 and July 8, CDHS developed a case definition (Table 2). All local health departments and poison-control centers in California participated in a surveillance program for acute illnesses related to melon ingestion. In addition to establishing the extent and severity of illnesses that occurred before July 4, surveillance was continued for illnesses related to melons stickered and presumed to be in compliance with a California Department of Food and Agriculture testing program and sold after July 10. Active surveillance continued until August 31 (Figure 1), although case reports were received through September 30. A total of 1,350 cases were reported from all regions of California and were classified as follows: before July 10, 1,005 reports were received—493 (49%) probable cases, 269 (27%) possible cases, and 195 (19%) unlikely cases; for 48 (5%), information was incomplete. For July 10 and after, 345 reports were received—197 (57%) probable cases, 101 (29%) possible cases, and 40 (12%) unlikely cases; for seven (2%), information was incomplete. There were 18 reports with date of illness missing. The majority (61%) were one-person incidents. Approximately 22% of the illnesses were two-person clusters, 10% were three-person clusters, and 3% were four-person clusters. The remainder involved clusters of five, six, nine, and 13 persons.

The most severe signs and symptoms included seizures, loss of consciousness, cardiac arrythmia, hypotension, dehydration, and anaphylaxis. Seventeen persons were hospitalized. Six deaths and two stillbirths following acute illnesses associated with watermelon ingestion were reported; however, none of the deaths were attributed by the coroners to ASO ingestion, and fetal tissues from both stillbirths tested negative for ASO. In a third pregnancy, decreased fetal movement was noted the same day as a watermelon-related illness in the mother. The mother subsequently gave birth to a normal child.

Of 250 laboratory tests on melons for ASO, 10 (4%) were positive. These 10 included one ASO-positive stickered watermelon associated with illness reported after July 10; an additional ASO-positive stickered watermelon was reported from Canada. Neither of these two positive melons could be traced back to specific fields.

In addition to the reports of watermelon-related illness, 77 illnesses associated with about 25 cantaloupes were reported. All cantaloupe specimens tested negative for ASO, and approximately half were screened for other pesticides (carbamates, organophosphates, and chlorinated pesticides) and were negative. Fewer complaints associated with other types of melons were reported.

Aldicarb Food Poisoning — Continued

Reported by all California local health departments and poison-control centers, RJ Jackson, MD, JW Stratton, MD, Hazard Evaluation Section, LR Goldman, MD, DF Smith, PhD, EM Pond, PhD, D Epstein, MA, RR Neutra, MD, Epidemiological Studies and Surveillance Section, A Kelter, MD, Office of Environmental Health Hazards Assessment, KW Kizer, MD, California Dept of Health Svcs; Special Studies Br, Div of Environmental Hazards and Health Effects, Center for Environmental Health, CDC.

Editorial Note: This is the largest recorded North American outbreak of foodborne pesticide illness. In addition to the 692 probable cases reported by California, 10 other jurisdictions in the United States and Canada reported 483 probable or possible cases according to their own case definitions: Alberta (20), Alaska (47), Arizona (one), British Columbia (206), Colorado (one), Hawaii (two), Idaho (80), Nevada (four), Oregon (104), and Washington (18).

Aldicarb is a carbamate insecticide used in citrus groves and potato fields. Unlike organophosphates, which also interfere with cholinesterase activity, inhibition of cholinesterase by carbamates is rapidly reversible.

TABLE 2. Case definitions for watermelon-associated illness outbreak — California, July 1985

CLASSIFICATION OF CHOLINERGIC SYMPTOMS

1. **Gastrointestinal symptoms:**

   Abdominal pain
   Nausea and/or vomiting
   Diarrhea

2. **Other peripheral autonomic symptoms:**

   Blurred vision and/or watery eyes
   Pinpoint pupils
   Excess salivation
   Sweating or clamminess

3. **Skeletal muscle symptoms:**

   Muscular weakness
   Twitching

4. **Central nervous system symptoms:**

   Seizures
   Disorientation or confusion
   Excitation

CLASSIFICATION OF ILLNESS REPORTS

1. **Probable case:**

   Melon positive for aldicarb or aldicarb metabolites.
   OR Onset less than 2 hours after consuming melon.

   AND ONE OF THE FOLLOWING:

   Multiple groups of cholinergic symptoms **or** a single group of symptoms and more than one person ill from the same melon.
   OR Onset between 2 and 12 hours after consuming melon, multiple symptoms, and more than one person ill from the same melon.

2. **Possible case:**

   Onset less than 2 hours after consuming melon, a single group of symptoms, and no other illnesses reported from the melon.
   OR Onset within 2 to 12 hours after consuming melon and multiple symptoms **or** symptoms from only one group.

3. **Unlikely case:**

   Some other cause of illness judged to be more likely.
   OR Any illness with onset of symptoms more than 12 hours after eating melon.

Aldicarb Food Poisoning — Continued

Aldicarb has the lowest LD_{50} of any pesticide registered in the United States (LD_{50} 1 mg/kg body weight) (*1*). Aldicarb sulfoxide has nearly the same LD_{50}. It has been associated with at least two deaths among agricultural workers (*2,3*). It is a highly effective systemic insecticide, readily taken up by the roots and carried into the stem, leaves, and fruit of the plant. Severe and potentially lethal contamination levels can result from intentional or inadvertent misapplication to certain crops, as seen in several prior episodes of foodborne aldicarb poisoning involving cucumbers and mint (*4,5*). It is not registered for use on melons.

Existing toxicologic data on aldicarb did not predict the severity of the acute illnesses associated with the dose levels found in this outbreak. Animal data do not predict long-term or reproductive effects from aldicarb and its metabolites, and it is not a suspected carcinogen (*6*). However, few reproductive studies have been conducted at doses that cause maternal toxicity, and, in rats, it has been shown to cause acetyl cholinesterase inhibition in fetal tissues (*7*).

In the California outbreak, coincidental onset of gastrointestinal illness within 2 hours of eating melon may explain some of the sporadic cases occurring through September. However, the source of illnesses is not clear among those who had illnesses compatible with carbamate poisoning but where laboratory testing of the melons was negative for ASO. Although some of these may have been coincidental, it is possible that the laboratory analyses are too insensitive to detect ASO at levels that can cause human illness. This issue has implications for monitoring pesticide residues in foods and needs further study.

References

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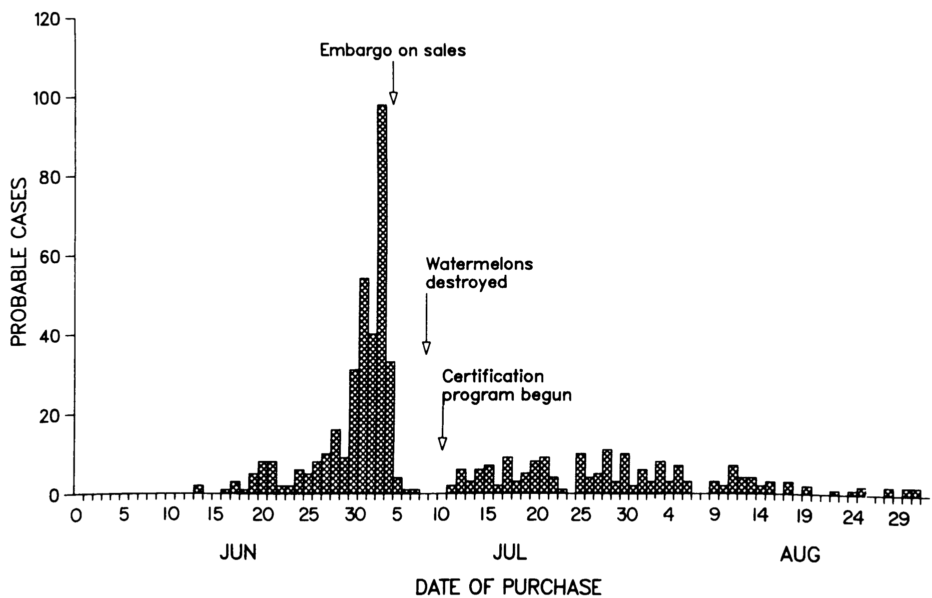
FIGURE 1. Probable watermelon-related illnesses, by date of purchase — California, June-August 1985



Aldicarb Food Poisoning — Continued

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TABLE I. Summary—cases specified notifiable diseases, United States

Disease	16th Week Ending			Cumulative, 16th Week Ending		
	Apr. 19, 1986	Apr. 20, 1985	Median 1981-1985	Apr. 19, 1986	Apr. 20, 1985	Median 1981-1985
Acquired Immunodeficiency Syndrome (AIDS)	261	152	N	3,843	2,030	N
Aseptic meningitis	75	44	63	1,290	1,083	1,237
Encephalitis: Primary (arthropod-borne & unspec.)	5	10	14	242	281	276
Post-infectious	-	2	2	25	40	29
Gonorrhea: Civilian	14,379	15,247	15,632	246,208	239,147	272,149
Military	332	265	358	4,790	5,600	7,413
Hepatitis: Type A	368	456	423	6,811	6,565	6,982
Type B	486	465	414	7,540	7,585	6,940
Non A, Non B	75	88	N	1,007	1,284	N
Unspecified	96	117	123	1,527	1,598	2,216
Legionellosis	9	11	N	166	184	N
Leprosy	6	16	7	86	130	67
Malaria	8	16	16	209	207	210
Measles: Total*	234	95	88	1,845	816	816
Indigenous	225	79	N	1,793	676	N
Imported	9	16	N	52	140	N
Meningococcal infections: Total	38	58	81	997	952	1,115
Civilian	38	57	81	995	950	1,113
Military	-	1	-	2	2	4
Mumps	45	84	85	1,020	1,278	1,304
Pertussis	60	33	28	640	469	469
Rubella (German measles)	17	7	29	163	122	373
Syphilis (Primary & Secondary): Civilian	344	493	564	7,420	7,551	9,335
Military	2	3	6	70	58	115
Toxic Shock syndrome	16	11	N	112	119	N
Tuberculosis	395	471	471	5,849	5,832	6,679
Tularemia	1	1	2	19	25	31
Typhoid fever	1	5	6	65	79	114
Typhus fever, tick-borne (RMSF)	2	5	8	20	24	26
Rabies, animal	89	114	157	1,514	1,416	1,739

TABLE II. Notifiable diseases of low frequency, United States

	Cum 1986		Cum 1986
Anthrax	-	Leptospirosis (Minn. 1)	14
Botulism: Foodborne	3	Plague	-
Infant (Calif. 1)	16	Poliomyelitis, Paralytic	-
Other	-	Psittacosis	16
Brucellosis (N.Y. City 1, Tex. 1)	16	Rabies, human	-
Cholera	-	Tetanus (Ariz. 1)	12
Congenital rubella syndrome	1	Trichinosis	7
Congenital syphilis, ages < 1 year	11	Typhus fever, flea-borne (endemic, murine) (Tex. 1)	6
Diphtheria	-		

*Five of the 234 reported cases for this week were imported from a foreign country or can be directly traceable to a known internationally imported case within two generations.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending April 19, 1986 and April 20, 1985 (16th Week)

Reporting Area	AIDS	Aseptic Menin-gitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionel-losis	Leprosy
			Primary	Post-in-fectious			A	B	NA,NB	Unspeci-fied		
	Cum. 1986	1986	Cum. 1986	Cum. 1986	Cum. 1986	Cum. 1985	1986	1986	1986	1986	1986	Cum. 1986
UNITED STATES	3,843	75	242	25	246,208	239,147	368	486	75	96	9	86
NEW ENGLAND	158	3	9	1	5,653	7,410	8	45	4	4	2	1
Maine	9	-	-	-	291	310	-	-	-	-	-	-
N.H.	7	1	2	-	160	155	-	-	-	-	-	-
Vt.	2	-	2	1	90	70	-	1	1	-	-	-
Mass.	92	2	2	-	2,439	2,690	3	27	2	3	2	1
R.I.	9	-	-	-	525	549	1	5	1	1	-	-
Conn.	39	-	3	-	2,148	3,636	4	12	-	-	-	-
MID ATLANTIC	1,441	6	40	-	43,956	33,710	13	34	11	34	-	9
Upstate N.Y.	121	2	14	-	4,795	4,791	4	9	1	1	-	1
N.Y. City	1,006	2	10	-	25,936	15,272	1	1	4	32	-	7
N.J.	227	2	5	-	5,978	6,720	1	13	2	-	-	-
Pa.	87	-	11	-	7,247	6,927	7	11	4	1	-	1
E.N. CENTRAL	213	4	49	4	29,519	34,096	12	29	3	2	1	4
Ohio	30	-	15	2	8,624	8,783	3	11	-	-	-	-
Ind.	25	-	5	2	4,452	3,182	1	6	-	1	-	-
Ill.	106	-	7	-	4,283	9,421	6	3	2	-	-	3
Mich.	47	4	21	-	10,335	10,039	2	9	1	1	1	1
Wis.	5	-	1	-	1,825	2,671	-	-	-	-	-	-
W.N. CENTRAL	74	2	6	5	11,111	12,279	23	16	3	1	1	1
Minn.	33	-	4	-	1,663	1,803	-	2	1	-	1	1
Iowa	8	-	2	-	1,087	1,320	2	1	-	-	-	-
Mo.	19	-	-	-	5,400	5,669	3	8	1	1	-	-
N. Dak.	2	-	-	-	109	86	-	-	-	-	-	-
S. Dak.	1	-	-	-	222	218	7	-	-	-	-	-
Nebr.	3	1	-	-	789	1,190	1	2	1	-	-	-
Kans.	8	1	-	5	1,841	1,993	10	3	-	-	-	-
S. ATLANTIC	497	11	41	11	60,574	51,628	21	86	7	2	2	1
Del.	9	1	3	-	1,027	1,136	2	2	-	-	-	-
Md.	46	1	10	-	7,901	8,296	2	7	-	-	1	-
D.C.	78	-	-	-	4,856	4,358	-	-	-	-	-	-
Va.	53	2	16	-	5,388	5,442	1	14	1	1	-	1
W. Va.	2	-	6	-	787	733	-	3	-	-	-	-
N.C.	24	-	5	1	10,512	9,567	1	16	-	-	-	-
S.C.	15	-	-	-	5,708	6,501	-	7	1	-	-	-
Ga.	64	-	-	-	6,682	-	2	13	-	-	-	-
Fla.	206	7	1	10	17,713	15,595	13	24	5	1	1	-
E.S. CENTRAL	32	2	18	1	20,795	20,764	4	26	3	-	-	-
Ky.	10	-	8	-	2,443	2,280	2	2	-	-	-	-
Tenn.	13	-	1	1	8,204	8,185	2	13	1	-	-	-
Ala.	5	1	9	-	5,796	6,528	-	9	1	-	-	-
Miss.	4	1	-	-	4,352	3,771	-	2	1	-	-	-
W.S. CENTRAL	337	13	20	-	30,749	33,504	52	28	4	19	-	5
Ark.	10	-	-	-	2,904	3,161	5	2	2	3	-	-
La.	44	2	2	-	5,503	6,962	3	4	-	-	-	-
Okla.	16	1	4	-	3,606	3,479	3	3	1	1	-	-
Tex.	267	10	14	-	18,736	19,902	41	19	1	15	-	5
MOUNTAIN	83	3	11	1	7,896	7,837	49	53	8	13	2	7
Mont.	1	-	-	1	194	233	1	4	-	3	-	-
Idaho	1	-	-	-	246	264	11	5	-	-	-	-
Wyo.	2	-	2	-	182	202	-	-	-	-	-	-
Colo.	36	-	2	-	2,041	2,361	5	9	-	-	1	3
N. Mex.	6	-	1	-	808	924	6	9	-	1	-	-
Ariz.	22	3	4	-	2,477	2,309	18	19	4	8	1	2
Utah	6	-	1	-	329	315	1	5	-	-	-	-
Nev.	9	-	1	-	1,619	1,229	7	2	4	1	-	2
PACIFIC	1,008	31	48	2	35,955	37,919	186	169	32	21	1	58
Wash.	34	3	5	-	2,670	2,661	12	10	4	-	1	6
Oreg.	20	-	-	-	1,421	1,952	21	17	6	-	-	-
Calif.	936	25	41	2	30,506	31,755	150	134	22	19	-	45
Alaska	8	2	2	-	960	948	3	5	-	2	-	-
Hawaii	10	1	-	-	398	603	-	3	-	-	-	7
Guam	-	-	-	-	30	56	-	1	-	-	-	1
P.R.	31	1	2	-	710	1,213	5	2	-	-	-	-
V.I.	-	-	-	-	71	141	-	-	-	-	-	-
Pac. Trust Terr.	-	-	-	-	51	235	2	-	-	-	-	1
Amer. Samoa	-	-	-	-	12	-	-	3	-	-	-	-

N: Not notifiable U: Unavailable

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending April 19, 1986 and April 20, 1985 (16th Week)

Reporting Area	Malaria	Measles (Rubeola)					Meningococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported *		Total									
	Cum. 1986	1986	Cum. 1986	1986	Cum. 1986	Cum. 1985	Cum. 1986	1986	Cum. 1986	1986	Cum. 1986	Cum. 1985	1986	Cum. 1986	Cum. 1985
UNITED STATES	209	225	1,793	9	52	816	997	45	1,020	60	640	469	17	163	122
NEW ENGLAND	12	-	10	-	-	51	74	3	31	-	38	23	-	1	5
Maine	-	-	-	-	-	-	14	-	-	-	2	2	-	-	-
N.H.	-	-	-	-	-	-	4	-	8	-	14	13	-	1	2
Vt.	1	-	-	-	-	-	11	-	-	-	1	2	-	-	-
Mass.	7	-	9	-	-	50	15	-	1	-	9	3	-	-	3
R.I.	1	-	1	-	-	-	10	-	4	-	1	1	-	-	-
Conn.	3	-	-	-	-	1	20	3	18	-	11	2	-	-	-
MID ATLANTIC	26	109	725	-	3	60	166	3	60	4	77	55	-	23	31
Upstate N.Y.	4	-	2	-	2	30	48	2	25	4	52	31	-	15	8
N.Y. City	8	-	91	-	1	20	36	-	5	-	3	7	-	5	7
N.J.	3	109	632	-	-	6	27	1	14	-	4	1	-	3	4
Pa.	11	-	-	-	-	4	55	-	16	-	18	16	-	-	12
E.N. CENTRAL	6	26	186	-	2	248	118	10	494	2	134	67	-	5	11
Ohio	1	-	-	-	-	14	55	-	53	-	62	13	-	-	-
Ind.	-	-	-	-	-	1	11	-	15	-	16	11	-	-	-
Ill.	3	26	117	-	-	140	27	-	276	-	16	12	-	4	5
Mich.	2	-	-	-	-	48	25	10	74	2	16	7	-	-	5
Wis.	-	-	69	-	2	45	-	-	76	-	24	24	-	1	1
W.N. CENTRAL	6	4	83	1	2	5	57	2	47	-	33	38	2	7	7
Minn.	2	-	1	-	-	2	12	-	1	-	16	11	-	-	-
Iowa	1	-	-	1§	1	-	6	1	8	-	5	2	-	-	-
Mo.	2	-	-	-	1	2	21	-	9	-	4	8	-	1	-
N. Dak.	-	-	-	-	-	-	-	-	2	-	2	6	-	-	-
S. Dak.	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-
Nebr.	1	-	-	-	-	-	7	-	-	-	-	1	-	-	-
Kans.	-	4	82	-	-	1	10	1	26	-	6	10	2	6	7
S. ATLANTIC	28	22	262	2	6	105	208	7	78	39	174	116	-	6	7
Del.	-	-	-	-	-	-	1	-	-	34	68	-	-	-	-
Md.	3	-	9	2§	4	6	28	-	4	2	23	40	-	-	1
D.C.	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-
Va.	6	3	3	-	-	12	38	3	12	-	9	3	-	-	-
W. Va.	-	-	2	-	-	2	3	1	26	1	4	-	-	-	-
N.C.	3	-	-	-	-	-	32	-	7	-	15	7	-	-	-
S.C.	2	19	237	-	-	-	24	2	11	-	2	-	-	-	2
Ga.	3	-	-	-	1	8	31	-	5	2	45	45	-	-	-
Fla.	11	-	11	-	1	76	49	1	13	-	8	21	-	6	4
E.S. CENTRAL	4	-	1	-	-	-	55	-	13	-	15	4	-	1	1
Ky.	2	-	-	-	-	-	9	-	2	-	1	1	-	1	1
Tenn.	-	-	1	-	-	-	25	-	9	-	5	1	-	-	-
Ala.	2	-	-	-	-	-	14	-	1	-	9	2	-	-	-
Miss.	-	-	-	-	-	-	7	-	1	-	-	-	-	-	-
W.S. CENTRAL	17	18	305	4	16	32	77	5	75	1	25	54	5	35	13
Ark.	-	16	281	-	-	-	10	-	6	1	2	9	-	-	1
La.	4	-	-	-	-	1	8	-	-	-	3	2	-	-	-
Okla.	2	-	2	-	-	-	12	N	N	-	20	43	-	-	-
Tex.	11	2	22	4†	16	31	47	5	69	-	-	-	5	35	12
MOUNTAIN	6	46	94	1	8	227	40	8	109	12	82	21	-	-	3
Mont.	-	-	-	-	1	121	4	-	2	-	-	3	-	-	-
Idaho	1	-	-	-	-	3	1	-	2	11	26	-	-	-	1
Wyo.	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
Colo.	1	-	-	-	3	3	7	1	6	-	16	8	-	-	-
N. Mex.	-	-	15	1†	4	1	4	N	N	-	8	3	-	-	1
Ariz.	2	46	79	-	-	99	12	7	95	-	23	3	-	-	1
Utah	1	-	-	-	-	-	4	-	1	1	9	4	-	-	-
Nev.	1	-	-	-	-	-	6	-	3	-	-	-	-	-	-
PACIFIC	104	-	127	1	15	88	202	7	113	2	62	91	10	85	44
Wash.	9	-	23	-	7	1	29	1	5	-	25	13	-	1	-
Oreg.	8	-	-	-	2	2	15	N	N	2	5	16	-	-	1
Calif.	87	-	85	-	5	78	151	4	98	-	29	57	10	83	32
Alaska	-	-	-	-	-	-	6	2	4	-	1	2	-	-	-
Hawaii	-	-	19	1†	1	7	1	-	6	-	2	3	-	1	11
Guam	1	-	3	-	-	10	-	-	2	-	-	-	-	2	1
P.R.	1	-	-	-	-	40	2	-	15	-	3	1	58	58	5
V.I.	-	-	-	-	-	9	-	1	7	-	-	-	-	-	-
Pac. Trust Terr.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amer. Samoa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*For measles only, imported cases includes both out-of-state and international importations.

N: Not notifiable U: Unavailable †International §Out-of-state

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending April 19, 1986 and April 20, 1985 (16th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1986	Cum. 1985	1986	Cum. 1986	Cum. 1985	Cum. 1986	Cum. 1986	Cum. 1986	Cum. 1986
UNITED STATES	7,420	7,551	16	5,849	5,832	19	65	20 +2	1,514
NEW ENGLAND	149	176	1	177	205	-	3	1	1
Maine	10	5	-	18	16	-	-	-	-
N.H.	6	3	-	4	6	-	-	-	-
Vt.	6	-	-	7	3	-	-	-	-
Mass.	73	93	-	88	125	-	2	1	-
R.I.	9	6	1	11	16	-	-	-	1
Conn.	45	69	-	49	39	-	1	-	-
MID ATLANTIC	1,058	1,015	-	1,141	1,117	-	7	1	136
Upstate N.Y.	54	73	-	183	173	-	1	1	24
N.Y. City	604	643	-	563	595	-	4	-	-
N.J.	210	219	-	205	101	-	2	-	-
Pa.	190	80	-	190	248	-	-	-	112
E.N. CENTRAL	181	350	3	769	726	-	4	-	27
Ohio	39	38	2	115	131	-	-	-	2
Ind.	40	31	-	90	85	-	-	-	7
Ill.	39	178	1	340	327	-	-	-	8
Mich.	44	85	-	183	143	-	3	-	3
Wis.	19	18	-	41	40	-	1	-	7
W.N. CENTRAL	71	78	-	163	156	6	3	1	205
Minn.	9	20	-	37	27	-	1	-	20
Iowa	5	12	-	13	25	1	-	-	47
Mo.	39	30	-	85	72	5	2	-	18
N. Dak.	2	-	-	2	2	-	-	-	57
S. Dak.	1	4	-	6	7	-	-	-	41
Nebr.	8	3	-	4	7	-	-	-	5
Kans.	7	9	-	16	16	-	-	1	17
S. ATLANTIC	2,127	1,890	1	1,149	1,168	4	6	6	385
Del.	11	14	-	13	10	-	-	-	-
Md.	142	138	-	80	88	1	-	-	231
D.C.	115	102	1	49	54	-	-	-	-
Va.	144	105	-	110	95	1	2	1	69
W. Va.	3	4	-	43	27	-	-	-	9
N.C.	165	224	-	152	148	1	2	2	1
S.C.	217	244	-	131	143	-	-	2	10
Ga.	256	-	-	143	168	1	-	1	44
Fla.	1,074	1,059	-	428	435	-	2	-	21
E.S. CENTRAL	513	662	-	517	510	3	-	5	90
Ky.	25	26	-	141	103	2	-	1	24
Tenn.	212	193	-	141	152	1	-	-	45
Ala.	180	226	-	173	174	-	-	1	21
Miss.	96	217	-	62	81	-	-	3	-
W.S. CENTRAL	1,622	1,920	2	718	610	5	3	5 +1	211
Ark.	88	90	1	90	55	3	-	-	44
La.	270	330	-	145	86	-	-	-	5
Okla.	49	48	1	62	72	2	1	3 1	19
Tex.	1,215	1,452	-	421	397	-	2	2	143
MOUNTAIN	192	242	2	110	142	-	2	1 +1	246
Mont.	2	1	-	5	19	-	-	-	93
Idaho	1	2	1	5	3	-	-	-	-
Wyo.	-	5	-	-	3	-	-	1 1	103
Colo.	61	58	-	1	18	-	-	-	-
N. Mex.	22	27	-	25	27	-	-	-	2
Ariz.	83	134	-	57	61	-	1	-	48
Utah	3	3	-	4	5	-	1	-	-
Nev.	20	12	1	13	6	-	-	-	-
PACIFIC	1,507	1,218	7	1,105	1,198	1	37	-	213
Wash.	27	47	-	62	58	-	2	-	-
Oreg.	31	30	-	39	40	-	-	-	-
Calif.	1,434	1,115	7	930	999	-	33	-	207
Alaska	-	1	-	17	44	1	-	-	6
Hawaii	15	25	-	57	57	-	2	-	-
Guam	1	2	-	-	12	-	-	-	-
P.R.	255	272	-	81	90	-	2	-	14
V.I.	-	1	-	1	1	-	-	-	-
Pac. Trust Terr.	54	15	-	7	23	-	10	-	-
Amer. Samoa	-	-	-	-	-	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending April 19, 1986 (16th Week)

Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	722	495	133	46	11	37	60
Boston, Mass.	198	128	36	20	6	8	24
Bridgeport, Conn.	46	32	10	2	-	2	1
Cambridge, Mass.	26	15	9	2	-	-	2
Fall River, Mass.	31	22	7	2	-	-	2
Hartford, Conn.	60	41	13	3	-	3	4
Lowell, Mass.	26	14	9	3	-	-	1
Lynn, Mass.	17	14	2	1	-	-	1
New Bedford, Mass.	22	21	1	-	-	-	3
New Haven, Conn.	67	35	8	4	2	18	2
Providence, R.I.	78	56	15	4	-	3	8
Somerville, Mass.	5	4	1	-	-	-	-
Springfield, Mass.	46	40	5	-	1	-	6
Waterbury, Conn.	29	20	5	2	1	1	2
Worcester, Mass.	71	53	12	3	1	2	4
MID ATLANTIC	2,806	1,860	601	228	67	48	156
Albany, N.Y.	55	36	11	3	2	3	1
Allentown, Pa.	24	21	2	1	-	-	-
Buffalo, N.Y.	100	60	29	6	2	3	8
Camden, N.J.	36	24	8	4	-	-	2
Elizabeth, N.J.	26	20	6	-	-	-	-
Erie, Pa.†	36	29	6	1	-	-	7
Jersey City, N.J.	55	36	12	4	2	1	-
N.Y. City, N.Y.	1,472	956	322	146	33	15	70
Newark, N.J.	84	36	21	17	5	3	3
Paterson, N.J.	23	13	7	3	-	-	3
Philadelphia, Pa.	416	285	93	19	10	9	27
Pittsburgh, Pa.†	90	60	23	4	2	1	4
Reading, Pa.	27	22	3	1	-	1	3
Rochester, N.Y.	122	88	23	5	4	2	16
Schenectady, N.Y.	26	21	1	2	2	-	3
Scranton, Pa.†	33	25	7	1	-	-	1
Syracuse, N.Y.	93	63	14	6	3	7	2
Trenton, N.J.	44	31	5	4	2	2	3
Utica, N.Y.	19	14	5	-	-	-	1
Yonkers, N.Y.	25	20	3	1	-	1	2
E.N. CENTRAL	2,293	1,472	497	168	63	93	93
Akron, Ohio	70	46	14	5	1	4	-
Canton, Ohio	39	26	11	2	-	-	1
Chicago, Ill.§	570	357	128	47	12	26	17
Cincinnati, Ohio	144	89	33	5	3	14	8
Cleveland, Ohio	170	93	47	14	7	9	2
Columbus, Ohio	127	82	26	8	6	5	5
Dayton, Ohio	123	91	22	7	1	2	3
Detroit, Mich.	245	140	55	27	13	10	8
Evansville, Ind.	44	27	10	6	1	-	2
Fort Wayne, Ind.	55	43	8	3	-	1	6
Gary, Ind.	17	8	5	2	1	1	1
Grand Rapids, Mich.	38	26	8	2	1	1	1
Indianapolis, Ind.	203	143	36	12	6	6	8
Madison, Wis.	30	21	6	2	1	-	4
Milwaukee, Wis.	126	94	21	7	2	2	3
Peoria, Ill.	53	34	15	1	2	1	11
Rockford, Ill.	49	28	11	4	1	5	1
South Bend, Ind.	37	27	5	1	2	2	3
Toledo, Ohio	97	66	17	8	3	3	5
Youngstown, Ohio	56	31	19	5	-	1	4
W.N. CENTRAL	741	497	162	42	17	23	39
Des Moines, Iowa	75	55	13	4	2	1	3
Duluth, Minn.	17	10	5	1	-	1	1
Kansas City, Kans.	40	26	9	3	1	1	1
Kansas City, Mo.	115	75	30	6	1	3	8
Lincoln, Nebr.	27	15	10	2	-	-	1
Minneapolis, Minn.	96	61	20	6	3	6	6
Omaha, Nebr.	86	57	18	5	2	4	6
St. Louis, Mo.	132	88	27	8	4	5	3
St. Paul, Minn.	77	56	15	3	2	1	2
Wichita, Kans.	76	54	15	4	2	1	8
S. ATLANTIC	1,524	948	357	106	51	62	75
Atlanta, Ga.	160	99	37	8	2	14	6
Baltimore, Md.	261	163	66	19	8	5	8
Charlotte, N.C.	82	53	16	8	2	3	8
Jacksonville, Fla.	108	71	22	9	5	1	9
Miami, Fla.	145	95	29	15	3	3	1
Norfolk, Va.	63	36	18	2	2	5	5
Richmond, Va.	90	53	21	3	5	8	6
Savannah, Ga.	49	34	11	2	1	1	7
St. Petersburg, Fla.	144	117	18	5	1	3	10
Tampa, Fla.	76	42	23	5	4	2	4
Washington, D.C.	323	166	94	28	18	17	10
Wilmington, Del.	23	19	2	2	-	-	1
E.S. CENTRAL	777	499	187	45	23	23	41
Birmingham, Ala.	122	73	34	9	3	3	4
Chattanooga, Tenn.	50	31	14	2	2	1	5
Knoxville, Tenn.	100	73	14	7	2	4	11
Louisville, Ky.	108	67	30	4	5	2	4
Memphis, Tenn.	174	116	38	10	5	5	9
Mobile, Ala.	89	51	28	2	3	5	3
Montgomery, Ala.	32	23	6	2	1	-	-
Nashville, Tenn.	102	65	23	9	2	3	5
W.S. CENTRAL	1,438	875	312	141	61	49	59
Austin, Tex.	56	37	10	5	1	3	1
Baton Rouge, La.	49	28	12	9	-	-	2
Corpus Christi, Tex.	43	26	11	4	1	1	4
Dallas, Tex.	191	109	40	22	13	7	3
El Paso, Tex.	53	35	10	4	2	2	4
Fort Worth, Tex.	98	64	17	9	7	1	6
Houston, Tex. §	434	255	92	49	19	19	12
Little Rock, Ark.	94	54	26	6	4	4	4
New Orleans, La.	107	61	30	9	3	4	-
San Antonio, Tex.	158	106	30	12	6	4	14
Shreveport, La.	54	34	12	5	-	3	3
Tulsa, Okla.	101	66	22	7	5	1	6
MOUNTAIN	670	425	122	62	38	22	44
Albuquerque, N.Mex.	104	66	15	9	10	3	9
Colo. Springs, Colo.	33	16	8	3	3	3	4
Denver, Colo.	103	68	20	9	3	3	6
Las Vegas, Nev.	89	46	20	13	7	3	2
Ogden, Utah	29	21	7	-	1	-	7
Phoenix, Ariz.	125	72	21	16	8	8	3
Pueblo, Colo.	23	21	-	1	1	-	3
Salt Lake City, Utah	43	28	8	3	2	2	2
Tucson, Ariz.	121	87	23	8	3	-	8
PACIFIC	1,819	1,174	369	162	60	49	104
Berkeley, Calif.	18	16	2	-	-	-	1
Fresno, Calif.	68	46	11	6	2	3	2
Glendale, Calif.	22	19	2	1	-	-	1
Honolulu, Hawaii	63	36	18	4	3	2	2
Long Beach, Calif.	115	73	24	7	2	9	13
Los Angeles, Calif.	332	190	72	46	15	5	6
Oakland, Calif.	101	67	15	14	1	4	5
Pasadena, Calif.	31	20	10	-	1	-	1
Portland, Oreg.	110	76	23	5	5	1	5
Sacramento, Calif.	155	103	36	10	4	1	13
San Diego, Calif.	209	138	37	17	10	7	24
San Francisco, Calif.	177	105	39	21	5	7	4
San Jose, Calif.	144	102	30	7	2	3	11
Seattle, Wash.	166	109	31	14	7	5	10
Spokane, Wash.	67	49	9	5	2	2	6
Tacoma, Wash.	41	25	10	5	1	-	-
TOTAL	12,790††	8,245	2,740	1,000	391	406	671

* 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.

§ Data not available. Figures are estimates based on average of past 4 weeks.

Ciguatera Fish Poisoning — Vermont

On October 29, 1985, the Epidemiology Division, Vermont Department of Health, learned of two persons with symptoms consistent with ciguatera fish poisoning. Both had eaten barracuda at a local restaurant on October 19. One ill person, a 48-year-old woman, had vomiting, diarrhea, myalgia, and chills 4 hours after the meal, followed the next morning by pruritus, flushing, burning of the tongue, and reversal of hot and cold temperature sensation of objects held in her hands. The second ill person, a 30-year-old male bartender at the restaurant, sought medical attention for severe myalgia and gingival and dental dysesthesia several hours after eating barracuda. In both patients, most symptoms subsided; however, some pruritus and temperature reversal persisted 6 weeks later. A third patron reported pruritus to the restaurant after the meal but was lost to follow-up. No additional cases were identified by contacting the two local emergency rooms and requesting case reports in the *Vermont Disease Control Bulletin*.

The restaurant had served 24 portions of barracuda received fresh by air from a fish distributor in Florida. Two other restaurants in Burlington had received barracuda from the same shipment. One served 44 portions, and the second froze all portions received. The fish distributor reported that the fish was purchased from boats fishing in Florida's coastal waters but could not identify the exact location. The distributor ships to locations throughout the contiguous United States. No information was available about the distribution of other fish from the same catch.

All portions of a single barracuda frozen by one restaurant and tested for ciguatoxin by enzyme immunoassay at the Department of Pathology, University of Hawaii, were positive for ciguatoxin.

Reported by RL Vogt, MD, State Epidemiologist, Vermont Dept of Health; AP Liang, MD, State Epidemiologist, Hawaii Dept of Health; Div of Field Svcs, Epidemiology Program Office, Enteric Diseases Br, Div of Bacterial Diseases, Center for Infectious Diseases, CDC.

Editorial Note: Human ciguatera poisoning can occur after consumption of a wide variety of coral reef fish, such as barracuda, grouper, red snapper, amberjack, surgeonfish, and sea bass (*1,2*). Ciguatoxin and related toxins are derived from dinoflagellates, which herbivorous fish consume while foraging through the macro-algae (*3*). Humans ingest the toxin by consuming either herbivorous fish or carnivorous fish that have eaten the contaminated herbivores. Larger, more predacious reef fish are generally more likely to be toxic (*4,5*). Since the toxin is heat-stable, cooking does not make the fish safe to eat.

As the domestic and imported fish industry expands its market, the diagnosis of this "tropical" disease must be considered even in areas to which coral-reef fish are not native. Ciguatera fish poisoning can be diagnosed by the characteristic combination of gastrointestinal and neurologic symptoms in a person who ate a suspect fish (*6*). The diagnosis can be supported by detection of ciguatoxin in the implicated fish.

Hawaii now uses a "stick test" immunoassay to detect ciguatoxin in fish (*7*). The test is sensitive, specific, inexpensive, and easy to use in the field. In Hawaii, if an outbreak-related fish tests positive for ciguatoxin, the reef area of catch is posted to discourage further fishing in that area. In Miami, Florida, because barracuda have been frequently associated with ciguatera poisoning, a city ordinance bans the sale of barracuda (*8*).

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Restaurant-Associated Scombroid Fish Poisoning — Alabama, Tennessee

Between December 31, 1985, and January 4, 1986, three restaurants in Alabama and Tennessee received complaints of illness from nine customers and one employee who ate Pacific amberjack fish (also called yellowtail or kahala). Detailed information was obtained on four of the 10 persons. Illness onset occurred 10-90 minutes after eating (median 23 minutes). Symptoms included red facial rash (4/4), body rash (2/4), severe headache (2/4), oral paresthesias (1/4), shortness of breath (2/4), vomiting (1/4), and diarrhea (3/4). Of the three persons who sought medical evaluation, one had diastolic hypotension, and one had bronchospasm. All three were diagnosed as having food or fish allergy and were treated with an antihistamine. Rash persisted for 2-5 hours (median 3 hours), and all other symptoms resolved in 3-36 hours (median 14 hours). One restaurant cook, who did not eat the fish, reported a transient red rash on the hands shortly after handling the fish.

Ill persons reported no other menu items in common. The fish meals were prepared by grilling or frying, and none of the restaurants reported using food preservatives or monosodium glutamate (MSG) on the fish.

In November 1985, a Florida seafood company procured 1,100 pounds of fresh amberjack from southern California. A 120-pound portion was resold December 30 to a distributor that in turn supplied the fish to nine restaurants in Alabama, Kentucky, and Tennessee. After receiving complaints from three of the restaurants, the distributor promptly notified all recipient restaurants and collected 20 pounds of amberjack. Analysis of the leftover fish by the U.S. Food and Drug Administration (FDA) showed 19 of 20 subsamples had markedly elevated levels of histamine (257-430 mg%). (Fresh fish normally contains less than 1 mg% of histamine.) The remaining fish, which had not been distributed, was destroyed under FDA supervision.

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Editorial Note: The symptoms of scombroid fish poisoning resemble those of a histamine reaction; the illness is characterized by flushing, headache, dizziness, burning of the mouth and throat, abdominal cramps, nausea, vomiting, and diarrhea. Urticaria and generalized pruritus often occur (*1*). In severe cases, bronchospasm and respiratory distress may develop (*2*).

Scombroid Fish Poisoning — Continued

Some victims complain that the toxic food has a sharp or peppery taste. Typical incubation periods are less than 1 hour, although wide variations can occur among individuals (*1*).

Scombroid means mackerel-like; mackerel, tuna, and bonito are related species that are often implicated in outbreaks of scombroid poisoning. However, nonscombroid species, such as the amberjack reported here, have also been implicated in scombroid poisoning (*2,3*). Of the 73 outbreaks of scombroid poisoning reported to CDC during the 5-year period 1978-1982, 31 (42%) implicated mahi-mahi (dolphin fish), a nonscombroid fish (*4*).

Poisoning is caused by the ingestion of spoiled fish. Histamine and probably other toxic by-products are produced by bacterial action on histidine, a normal muscle constituent of dark-meat fishes (*5*). Scombroid poisoning is a response to toxic by-products—not an allergic reaction to fish. Once formed, the toxins are heat-stable, so the best defense against poisoning is prompt storage of freshly caught fish at 0 C (32 F) or below (*6*). Laboratory confirmation of scombroid fish poisoning is based on demonstrating elevated histamine levels in incriminated fish (*1*). Public health authorities should be notified when this or other fish-related illness is suspected so that the distribution of the implicated food can be determined.

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Cytotoxicity of Volcanic Ash: Assessing the Risk for Pneumoconiosis

The recent eruptions of the Mount Augustine volcano in Alaska, which began March 27, 1986, have again raised concerns about the possible adverse health effects of exposure to volcanic dusts (*1*). Following similar eruptions at Mount St. Helens in Washington State, beginning May 18, 1980 (*2*); El Chichon, south of Mexico City, Mexico, March 29, 1982; and Galunggung in West Java, Indonesia, May 5, 1983, immediate, acute, and nonspecific irritant effects were reported in the eyes and upper airways of persons exposed to volcanic dusts over wide geographic areas. Moreover, repeated exposures to high concentrations of volcanic ash can pose a potential risk for the development of pneumoconiosis, especially if the particle-size distribution of volcanic ash includes an appreciable proportion of respirable-sized particles ($\leq$ 10 μm in median mass aerodynamic diameter [MMAD]) which contain the toxic mineral, free crystalline silica (SiO_2). Because such exposures may involve workers who are regularly employed outdoors, as well as workers specifically assigned to clean up after volcanic eruptions, the National Institute for Occupational Safety and Health (NIOSH) has conducted laboratory-based studies to provide indices of the cytotoxicity and fibrogenicity of various substances possibly present in volcanic ash. These indirect evaluations indicated that certain respirable fractions of volcanic ash were moderately cytotoxic in vitro and mildly fibrogenic in vivo (*3-6*).

Volcanic Ash — Continued

To determine whether these results are representative of other types of volcanic ash, NIOSH compared the cytotoxicity of samples from the eruptions of Mount St. Helens, El Chichon, and Galunggung with those of a mineral of known cytotoxicity, quartz, and a relatively inert mineral, barite. Assays for cytotoxicity were based on the hemolysis of the red cells of sheep and the release of the enzymes, lactate dehydrogenase, B-N-acetylglucosaminidase, and B-glucuronidase, from alveolar macrophages (Table 3). The ash samples were all similar in quartz content and elemental composition. However, the sample of volcanic ash from Galunggung was significantly more cytotoxic than the other ash samples and approximated the cytotoxicity of quartz. The samples of volcanic ash from Mount St. Helens and El Chichon had cytotoxicities about midway between those of quartz and barite. Differences in the cytotoxicities of volcanic ash were related more to differences in the particle-size distributions in each ash sample than to differences in minerologic composition; those samples having the greater proportions of small particles (i.e., more surface area per given weight of ash sample) exhibited more cytotoxic activity.

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Editorial Note: Exposure to airborne mineral dusts has been associated with the subsequent development of chronic bronchitis (mucous hypersecretion or obstructive-airways disease) and/or pneumoconiosis in humans. Pulmonary fibrosis usually results from cumulative exposure to dust, and may not become manifest until several decades after initial exposure. The type and severity of disease resulting from exposure to mineral dusts depends to a large extent on the size, shape, surface characteristics, chemistry, and crystallinity of the dust particles.

Several methods have been developed to measure the cytotoxicity of mineral dusts in vitro. The two methods reported here use the hemolysis of bovine red cells and the release of lysosomal enzymes from alveolar macrophages as end points. Although many minerals show good correlation between the values obtained in these tests and in vivo fibrogenicity, the occurrence of false-positive and false-negative results may weaken the predictive value of the tests. Further study is needed to determine the causes of these discrepancies and the exact relationship between cytotoxicity and fibrogenicity.

Volcanic ash is a good example of an environmental hazard with unknown potential to cause pneumoconiosis in human populations (*1*). The results of these studies show that ash from all three volcanoes was cytotoxic in vitro, and exposure studies conducted in animals in-

TABLE 3. Comparison of the cytotoxicity of samples of volcanic ash and two minerals

Mineral/ash	% hemolysis (10 mg dust/ml)	% free silica	% particles < 10 μm MMAD	Enzymes released (1 mg dust/ml)* LDH†	B-NAG§	B-GLUC¶
Silica	97	99	98	45	32	26
Galunggung-1	66	1.4-1.9	8.8-16.5	51	30	23
El Chichon	61	1.7	6.2	33	18	13
Mount St. Helens	32	1.5	81	31	15	12
Barite	16	0	98	34	20	16

*Units per 2×10^6 cells/ml/2 hours.

†Lactate dehydrogenase.

§B-N-acetylglucosaminidase.

¶B-glucuronidase.

Volcanic Ash – Continued

dicate that volcanic ash is mildly fibrogenic in vivo (*1,5*). However, the results of a 5-year longitudinal follow-up of loggers exposed to volcanic ash from Mount St. Helens suggest that risks of chronic bronchitis or pneumoconiosis are probably negligible in humans under the usual conditions of such occupational exposure, i.e., initially high and decreasing over time. Following an explosive volcanic eruption, with significant potential for chronic human exposure to volcanic ash, it would be appropriate to evaluate the size distribution of the sedimented ash and the percentage of free crystalline silica in the respirable-sized ash particles. Based on such an evaluation and a consideration of the intensity, frequency, and duration of exposure, it would be possible to provide appropriate advice to occupational and community groups about the need for limiting or avoiding exposures.

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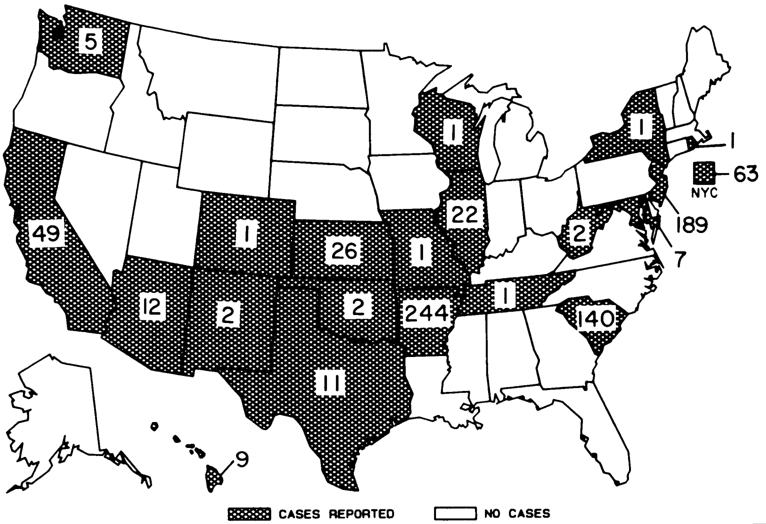
FIGURE I. Reported measles cases — United States, weeks 12-15, 1986



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The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Such reports and any other matters pertaining to editorial or other textual considerations should be addressed to: ATTN: Editor, *Morbidity and Mortality Weekly Report*, Centers for Disease Control, Atlanta, Georgia 30333.

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