CENTERS FOR DISEASE CONTROL

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MORBIDITY AND MORTALITY WEEKLY REPORT



## World Health Day 1991

The theme for World Health Day, April 7, 1991, is "Should Disaster Strike—Be Prepared." Cosponsors for World Health Day are the World Health Organization, the Pan American Health Organization, the American Association of World Health, and the U.S. Department of Health and Human Services.

This issue of *MMWR* focuses on international health and comprises reports on a pellagra outbreak among Mozambican refugees; knowledge and beliefs about acquired immunodeficiency syndrome and sexual behaviors among teenagers in Italy; a nutritional assessment in Haiti; and an update of the cholera epidemic in South America.

*International Notes*

## Outbreak of Pellagra Among Mozambican Refugees – Malawi, 1990

Micronutrient deficiency disorders, including pellagra, have emerged as major problems in refugee populations that depend on international relief assistance for food supplies (*1,2*). This report summarizes an investigation of pellagra that occurred among Mozambican refugees in Malawi during 1990.

Since 1987, approximately 900,000 Mozambicans have fled armed conflict in their homeland to seek refuge in neighboring Malawi. Approximately half are housed in refugee camps; the remainder live in villages integrated with the local Malawian population. Overall refugee relief assistance is coordinated by the Office of the United Nations High Commissioner for Refugees (UNHCR). Health care is provided by Malawian Ministry of Health personnel assisted by private voluntary organizations. During July–October 1989, 1169 cases of pellagra were detected among Mozambican refugees settled in 11 sites (including both camps and integrated villages) in southern Malawi (*1*). From February 1 through October 30, 1990, 17,878 cases were reported among 285,942 refugees (attack rate [AR]=6.3%) (Figure 1).

*Pellagra — Continued*

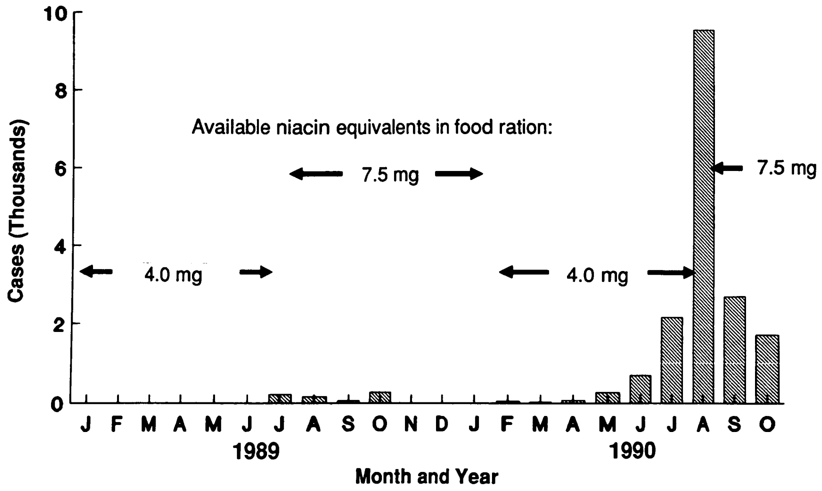
During the 1989 outbreak, Médecins Sans Frontières, Paris (MSF), the private voluntary organization that provided health care in the 11 sites, established a passive surveillance system in which persons with pellagra who presented to health facilities were recorded separately. (Previously, pellagra cases were reported as unspecified "nutritional disorders" according to the national disease surveillance system.) In July 1990, active case detection was instituted, and detailed information was collected on each patient (including age, sex, address, nationality, date of arrival in Malawi, duration of illness, and clinical signs).

A case of pellagra was defined as dermatitis on two different and symmetrical sites exposed to sunlight or a typical Casal's necklace (Figure 2). Of a sample of 992 case-patients reported in 1990, approximately 60% had associated stomatitis, and 19% had diarrhea. Diagnosis was confirmed at the National Institute of Agronomy in Paris by urinalysis for niacin metabolites (2-pyridone and N1-methyl nicotinamide) in four cases of clinical pellagra (*3*).

ARs ranged from 0.5% to 13.2% among the 11 refugee sites. The AR for children aged <5 years was 1.6%, and for all other age groups combined, 7.3%. Based on population estimates provided by the UNHCR, the AR for females was 7.8 times higher than that for males. ARs in camps were higher than those in integrated villages.

To identify potential risk factors for illness, MSF conducted a matched-pair case-control study from June 11 through June 23. Cases selected were the first 126 consecutive persons with pellagra at the outpatient facility of the three most affected sites. For each patient, one age-, sex-, and location-matched control was selected. Each patient and control provided information about sociodemographic characteristics, nutritional habits, and sources of food. A multivariate analysis suggested that three factors independently protected against pellagra: daily groundnut consumption (odds ratio [OR]=0.1; 95% confidence interval [CI]=0.01–0.95), home maize milling (OR=0.3; 95% CI=0.1–0.5), and garden ownership (OR=0.3; 95% CI=0.15–0.6).

**FIGURE 1. Pellagra cases among Mozambican refugees in 11 selected sites, by month — Malawi, January 1989–October 1990**



*Pellagra — Continued*

For 1989 and 1990, food supply records from UNHCR, the World Food Program, and the Malawian government were used to calculate the mean daily per capita quantity of available niacin equivalents (ANE) in food distributed to refugees, based on bioavailability of 30% of the niacin in maize flour (*4*). Groundnut distribution had been disrupted from January through May 1989 and again from January through July 1990, with a corresponding mean daily distribution during these periods of approximately 4.0 mg ANE per person per day (Table 1) (*5*).

In August 1990, a groundnut supply was identified on the world market, purchased, transported to Malawi, and distributed to refugees by UNHCR; MSF; and Save the Children Fund, United Kingdom. In addition, nicotinamide was used to treat clinical cases, and vitamin B complex tablets were distributed as a preventive measure to refugees living in camps. Active surveillance of new cases is being used to quantify the impact of prevention and control measures.

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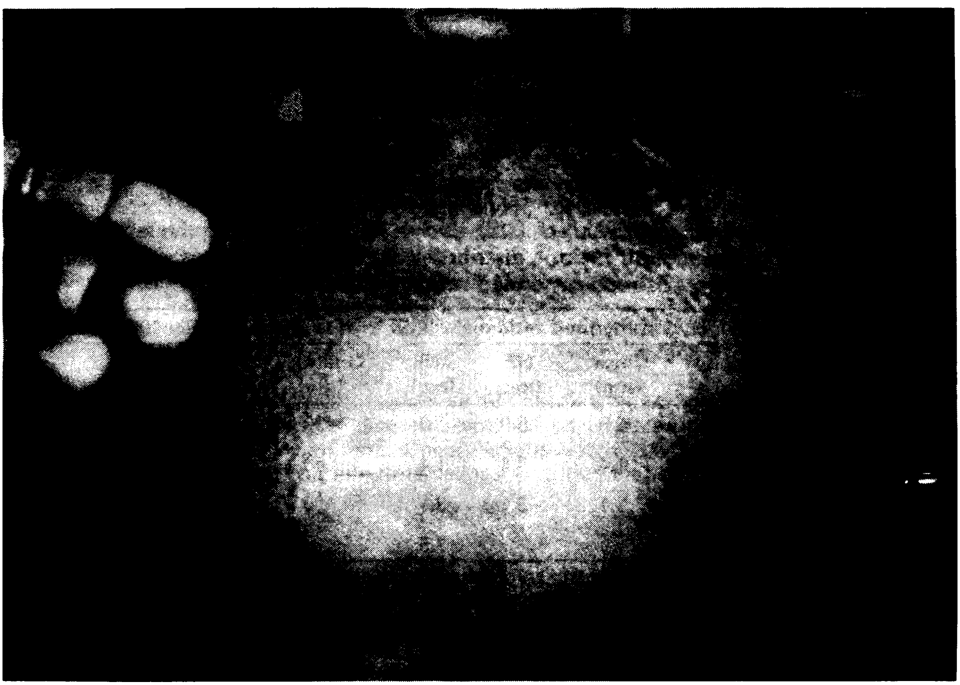
**Editorial Note:** Pellagra is a nutritional deficiency disease characterized by dermatitis on areas of the body exposed to sunlight, such as the face, neck, arms, and legs. In severe cases, diarrhea, dementia, and eventually death can occur. First described by

**FIGURE 2. Casal's necklace, characteristic of pellagra**



*Pellagra – Continued*

Gaspar Casal in Spain in the mid-18th century, pellagra was highly prevalent in maize-consuming populations (e.g., in the southeastern United States, Mediterranean countries of Europe, and North Africa) until the 1930s. In the 1920s, Casimir Funk in France and Joseph Goldberger of the U.S. Public Health Service determined that the cause of pellagra was a nutritional deficiency (*6*). The specific micronutrient lacking in the diet of pellagra patients was eventually identified as niacin (nicotinic acid or niacinamide). During World War II, pellagra declined in the United States because of mandatory enrichment of bread flour and other cereal grains with niacin. Socio-ecoconomic factors that also contributed to the elimination of pellagra in the United States, Italy, and other areas with endemic pellagra were the cessation of sharecropping and the resulting increased access to pellagra-protective foods.

A high proportion of dietary niacin is derived from tryptophan, which is metabolized in the body to niacinamide; the common association of pellagra with diets high in maize results from the low tryptophan content of the principle maize protein (zein) and the biologically unavailable form of niacin in maize (*7*). In Mexico and Central America, where maize is the staple cereal, pellagra is prevented by treatment of maize-flour with lime ("alkali cooking"), which increases the bioavailability of the niacin. Sporadic cases of pellagra continue to be reported from Egypt, India, and countries in eastern and southern Africa. In the 1970s, >100,000 cases of endemic pellagra were reported annually in South Africa (*8*).

The 1990 pellagra epidemic in Malawi was the most extensive reported in the world since World War II. More than 18,000 cases were reported from all districts, hosting approximately 900,000 refugees in southern Malawi, for an overall AR of 2.0% (J Stuckey, UNHCR, Blantyre, Malawi, unpublished data, December 1990). However, ARs varied greatly by location, from <0.5% in integrated villages to 1.2%–11.3% in districts where refugees lived in camps. ARs in integrated villages may have been lower than in camps because refugees in such settings had increased access to alternative food sources of niacin.

Because groundnuts were not available for prolonged periods during 1990, the food ration for Mozambican refugees contained about 4.0 mg ANE (or <2.0 mg per 1000 kcal energy intake), substantially less than the recommended daily allowance

**TABLE 1. Niacin, niacin equivalent* (NE), and available niacin equivalent† (ANE) of selected items of basic food ration§ distributed to Mozambican refugees, January–July 1990, compared with recommended ration – Malawi, 1990**

| | Recommended ration | | | | January–July 1990 ration | | | |
|---|---|---|---|---|---|---|---|---|
| Food item | Quantity (gm) | Niacin (mg) | NE (mg) | ANE (mg) | Quantity (gm) | Niacin (mg) | NE (mg) | ANE (mg) |
| Maize flour | 400 | 5.6 | 6.9 | 3.0 | 400 | 5.6 | 6.9 | 3.0 |
| Beans | 60 | 1.4 | 1.4 | 1.4 | 40 | 1.0 | 1.0 | 1.0 |
| Groundnuts | 20 | 3.1 | 3.1 | 3.1 | 0 | – | – | – |
| **Total** | | | | **7.5** | | | | **4.0** |

*The sum of the niacin and 1/60 of the tryptophan (by weight).

†The total amount of niacin biologically available; in maize, this is calculated by adding 30% of the niacin and 1/60 of the tryptophan. One hundred percent of niacin in beans and groundnuts is bioavailable.

§Ration also contained vegetable oil, sugar, and salt, which contain no niacin.

*Pellagra — Continued*

(RDA) of 6.6 mg per 1000 kcal (*4* ). Because of the high niacin equivalent (NE) content in groundnuts, consumption of this item was protective against pellagra in refugees in Malawi. Although home milling of maize probably does not substantially increase dietary niacin, it may reflect access to other dietary sources.

The higher risk for pellagra among refugee women is consistent with reports of pellagra in the southeastern United States in the early 1900s and might reflect decreased access to foods containing niacin (e.g., meat, fish, and nuts), as well as a higher requirement for NE per 1000 kcal (*9* ). In contrast, the lower AR for children aged <5 years may result in part from breastfeeding (i.e., milk has a high niacin content); however, the data from Malawi do not differentiate risk between children aged <2 years and 2–5 years.

The outbreak in this report underscores the vulnerability of refugee populations to micronutrient deficiency diseases. Other micronutrient deficiency diseases reported from refugees in Africa have included scurvy, vitamin A deficiency, iron deficiency anemia, and beriberi (*2* ). The severe morbidity and mortality associated with micronutrient disorders, such as pellagra and scurvy, emphasize the need to supply minimal levels of energy and micronutrients to dependent refugee populations, as recommended by the United Nations (*10* ). Donor organizations must be aware of the need to provide adequate amounts of basic food commodities to relief agencies. Public health surveillance systems established in refugee populations should include micronutrient deficiency disorders among routinely monitored health problems.

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# AIDS-Related Knowledge and Behaviors Among Teenagers — Italy, 1990

As of December 31, 1990, the number of acquired immunodeficiency syndrome (AIDS) cases in Italy exceeded 8000 (*1*). Although 67% of AIDS cases in Italy occurred among intravenous (IV)-drug users, the role of transmission through heterosexual contact with human immunodeficiency virus (HIV)-infected persons has increased, accounting for 7% of cases in 1990, compared with 2% in 1985. As part of an AIDS epidemiology course in Frascati for regional AIDS epidemiologists (approximately 20 km [13 miles] south of Rome) in November 1990, course participants surveyed AIDS-related knowledge and behaviors among students attending the five high schools in the local school district. This report summarizes findings of the survey, which aimed to characterize AIDS-related knowledge and behaviors of this population.

Survey participants were students attending the five high schools in the district. Each school had five grade levels; ages of students range from 14 to 19 years. Of the 112 homeroom classrooms in the district, 27 classrooms were randomly selected for the survey. A self-administered, anonymous questionnaire, identical to that used to survey U.S. high school students (*2*), was administered to all 547 students in the selected classrooms.

Fifty-two percent of the respondents were male. A greater percentage of students were in the lower grade levels (range: 36% in grade level 1 to 10% in grade level 5), reflecting the smaller number of classes and smaller class sizes in the higher grade levels. Of the students sampled, 28% attended classical or scientific high schools, and 72% attended technical high schools—a distribution similar to that of the district.

Overall, 98% of students correctly identified IV-drug use and 95% correctly identified sexual intercourse without a condom as risk factors for AIDS. In addition, 54% knew that AIDS cannot be contracted from using public toilets; 51%, AIDS cannot be contracted by having a blood test; 48%, AIDS is not transmitted through insect bites; and 41%, AIDS cannot be contracted through blood donation. Although 92% identified condoms as protective, 64% knew that oral contraceptives do not protect against AIDS. In general, knowledge levels were higher in the upper grade levels and the classical and scientific schools.

Sixty-two percent of students reported obtaining their information about AIDS from television. Fifty-nine percent indicated they would ask medical personnel for correct information about AIDS; 18%, their parents; and 6%, their teachers.

One percent of students reported having used drugs intravenously (0.4% of females and 1.7% of males); 0.4% of students reported having shared needles. Twenty-three percent reported having had sexual intercourse, and 4% reported having had four or more sex partners. In general, sexual activity was reported more commonly by males, and males reported initiating sexual activity at an earlier age than females (Figure 1). Ages of initiating sexual activity were similar for students in all schools.

Although levels of knowledge concerning the protective effect of condoms were high, reported use of condoms was low: among sexually active students, 14% of males and 41% of females reported never using condoms; 54% of males and 37% of females reported always using condoms.

*AIDS — Continued*

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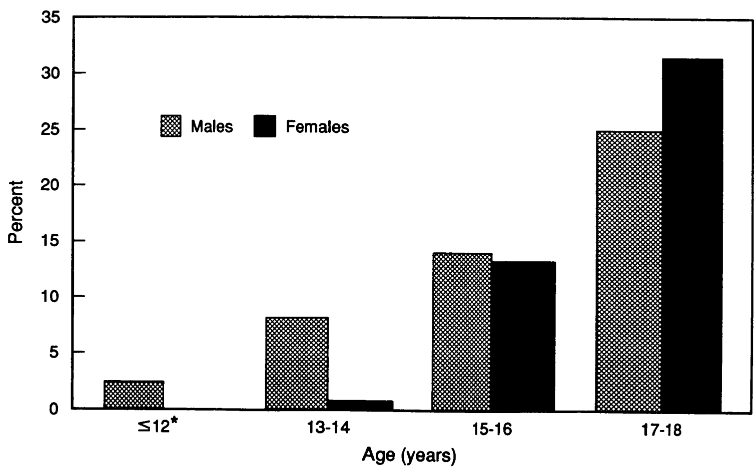
**Editorial Note:** Although the proportion of incorrect responses among the students in this survey was higher than that reported in the United States (*2*), these findings are consistent with those from other urban high schools in Italy (*3,4*). Incorrect knowledge about means of transmission can lead to unnecessary fears and stigmatization of HIV-infected persons and may limit the effect of public health messages concerning the risks associated with IV-drug use and high-risk sexual practices. In addition, the incorrect belief that oral contraceptives protect against HIV infection may prevent persons from taking appropriate precautions to protect themselves. These findings indicate the need for educational efforts that promote correct knowledge and understanding of risk factors associated with HIV infection.

Previous surveys of students in Italy did not address IV-drug use. The prevalence of reported IV-drug use in this survey was lower than that of U.S. students, although differences may be accounted for in part by the relatively younger ages of the students in Italy and by cultural differences in the acceptability of reporting IV-drug–use behaviors. The findings of this survey are also consistent with previous reports that most IV-drug users in Italy share needles, and virtually all begin doing so within a year of beginning IV-drug use (*5*). In view of both these findings and the

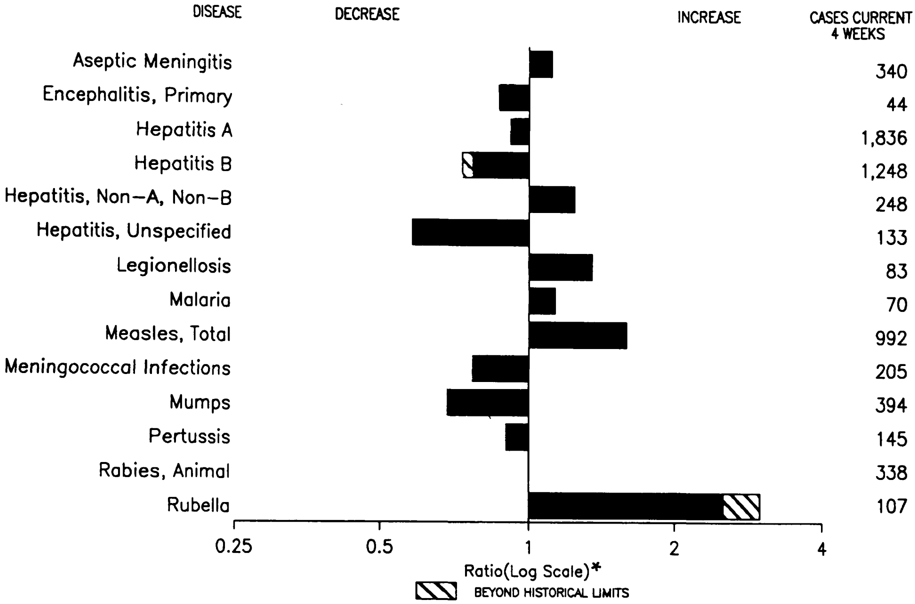
*(Continued on page 221)*

**FIGURE 1. Percentage of high school students who reported having had sexual intercourse, by sex and age of initiation — Frascati, Italy, 1990**




*No females reported initiating sexual activity at this age.

**FIGURE I. Notifiable disease reports, comparison of 4-week totals ending March 30, 1991, with historical data — United States**




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

**TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending March 30, 1991 (13th Week)**

| | Cum. 1991 | | Cum. 1991 |
|---|---|---|---|
| AIDS | 10,923 | Measles: imported | 30 |
| Anthrax | - | indigenous | 1,721 |
| Botulism: Foodborne | 5 | Plague | - |
| Infant | 14 | Poliomyelitis, Paralytic* | - |
| Other | 4 | Psittacosis | 25 |
| Brucellosis | 12 | Rabies, human | - |
| Cholera | - | Syphilis, primary & secondary | 10,364 |
| Congenital rubella syndrome | 7 | Syphilis, congenital, age < 1 year | - |
| Diphtheria | 1 | Tetanus | 1 |
| Encephalitis, post-infectious | 16 | Toxic shock syndrome | 88 |
| Gonorrhea | 137,569 | Trichinosis | 2 |
| *Haemophilus influenzae* (invasive disease) | 977 | Tuberculosis | 4,484 |
| Hansen Disease | 23 | Tularemia | 18 |
| Leptospirosis | 21 | Typhoid fever | 72 |
| Lyme Disease | 1,099 | Typhus fever, tickborne (RMSF) | 15 |

*No cases of suspected poliomyelitis have been reported in 1991; none of the 6 suspected cases in 1990 have been confirmed to date. Five of the 13 suspected cases in 1989 were confirmed and all were vaccine associated.

# TABLE II. Cases of selected notifiable diseases, United States, weeks ending March 30, 1991, and March 31, 1990 (13th 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. 1991 | Cum. 1991 | Cum. 1991 | Cum. 1991 | Cum. 1991 | Cum. 1990 | Cum. 1991 | Cum. 1991 | Cum. 1991 | Cum. 1991 | Cum. 1991 | Cum. 1991 |
| UNITED STATES | 10,923 | 1,197 | 131 | 16 | 137,569 | 172,077 | 6,163 | 3,796 | 703 | 370 | 267 | 1,099 |
| NEW ENGLAND | 444 | 57 | 8 | - | 3,839 | 4,828 | 144 | 232 | 32 | 9 | 27 | 41 |
| Maine | 15 | 4 | 3 | - | 33 | 66 | 5 | 5 | 2 | - | - | - |
| N.H. | 16 | 3 | - | - | 77 | 65 | 14 | 6 | 2 | - | 1 | 2 |
| Vt. | 6 | 5 | - | - | 16 | 19 | 6 | 1 | 1 | - | - | 1 |
| Mass. | 244 | 19 | 3 | - | 1,574 | 1,721 | 78 | 189 | 24 | 7 | 25 | 28 |
| R.I. | 18 | 22 | - | - | 289 | 263 | 20 | 10 | 1 | 2 | 1 | 10 |
| Conn. | 145 | 4 | 2 | - | 1,850 | 2,694 | 21 | 21 | 2 | - | - | - |
| MID. ATLANTIC | 3,108 | 160 | 6 | 5 | 14,202 | 23,840 | 454 | 328 | 59 | 9 | 68 | 881 |
| Upstate N.Y. | 470 | 74 | 5 | 3 | 2,872 | 3,459 | 289 | 158 | 38 | 3 | 25 | 766 |
| N.Y. City | 1,616 | 9 | - | - | 3,197 | 10,197 | 25 | 6 | - | - | 3 | - |
| N.J. | 685 | - | - | - | 2,800 | 3,938 | 51 | 79 | 8 | - | 7 | 115 |
| Pa. | 337 | 77 | 1 | 2 | 5,333 | 6,246 | 89 | 85 | 13 | 6 | 33 | - |
| E.N. CENTRAL | 854 | 211 | 36 | 4 | 25,175 | 33,609 | 636 | 451 | 90 | 17 | 49 | 44 |
| Ohio | 193 | 75 | 9 | 1 | 8,109 | 9,993 | 122 | 104 | 53 | 7 | 25 | 28 |
| Ind. | 63 | 26 | 5 | 1 | 2,836 | 2,835 | 127 | 56 | 1 | - | 3 | - |
| Ill. | 397 | 30 | 6 | 2 | 6,908 | 10,610 | 193 | 36 | 3 | - | 1 | - |
| Mich. | 153 | 72 | 15 | - | 6,471 | 8,047 | 97 | 152 | 31 | 10 | 14 | 16 |
| Wis. | 48 | 8 | 1 | - | 851 | 2,124 | 97 | 103 | 2 | - | 6 | - |
| W.N. CENTRAL | 314 | 88 | 7 | - | 7,317 | 9,319 | 822 | 161 | 81 | 6 | 15 | 6 |
| Minn. | 68 | 16 | 5 | - | 758 | 1,123 | 96 | 14 | 5 | 1 | 3 | 2 |
| Iowa | 22 | 22 | - | - | 492 | 723 | 20 | 9 | 6 | - | - | 4 |
| Mo. | 160 | 34 | - | - | 4,412 | 5,353 | 188 | 122 | 69 | 4 | 7 | - |
| N. Dak. | 18 | - | - | - | 11 | 40 | 13 | 2 | - | 1 | - | - |
| S. Dak. | - | 4 | 2 | - | 107 | 53 | 347 | 1 | - | - | 3 | - |
| Nebr. | 14 | 7 | - | - | 517 | 423 | 136 | 10 | - | - | 2 | - |
| Kans. | 32 | 5 | - | - | 1,020 | 1,604 | 22 | 3 | 1 | - | - | - |
| S. ATLANTIC | 2,506 | 279 | 25 | 6 | 42,306 | 47,332 | 417 | 879 | 106 | 89 | 34 | 34 |
| Del. | 22 | 7 | - | - | 565 | 607 | 5 | 15 | 4 | 3 | - | 10 |
| Md. | 276 | 29 | 4 | - | 3,907 | 4,977 | 98 | 117 | 21 | 6 | 8 | 12 |
| D.C. | 164 | 11 | - | - | 2,746 | 2,491 | 31 | 25 | 1 | 1 | - | - |
| Va. | 186 | 50 | 5 | - | 4,216 | 4,835 | 47 | 66 | 6 | 66 | 3 | 7 |
| W. Va. | 10 | 2 | 1 | - | 308 | 341 | 8 | 23 | 1 | 3 | - | 1 |
| N.C. | 102 | 32 | 10 | - | 8,030 | 7,987 | 61 | 159 | 39 | - | 6 | 4 |
| S.C. | 80 | 10 | - | - | 3,304 | 4,031 | 12 | 212 | 15 | 2 | 8 | - |
| Ga. | 353 | 25 | 3 | 1 | 10,852 | 10,434 | 48 | 104 | 6 | - | 2 | - |
| Fla. | 1,313 | 113 | 2 | 5 | 8,378 | 11,629 | 107 | 158 | 13 | 8 | 7 | - |
| E.S. CENTRAL | 260 | 77 | 6 | - | 12,668 | 14,192 | 58 | 304 | 86 | 3 | 19 | 21 |
| Ky. | 57 | 20 | 2 | - | 1,228 | 1,656 | 8 | 51 | 5 | 2 | 11 | 12 |
| Tenn. | 70 | 16 | 3 | - | 4,692 | 4,416 | 34 | 218 | 78 | - | 6 | 6 |
| Ala. | 62 | 27 | 1 | - | 3,448 | 4,869 | 15 | 34 | 3 | 1 | 2 | 3 |
| Miss. | 71 | 14 | - | - | 3,300 | 3,251 | 1 | 1 | - | - | - | - |
| W.S. CENTRAL | 951 | 71 | 10 | - | 16,469 | 17,147 | 741 | 330 | 19 | 48 | 9 | 15 |
| Ark. | 42 | 25 | 1 | - | 1,817 | 2,307 | 108 | 25 | 1 | 2 | 1 | 7 |
| La. | 182 | 8 | 1 | - | 3,301 | 3,074 | 37 | 66 | 1 | 2 | 3 | - |
| Okla. | 27 | 1 | 3 | - | 1,596 | 1,536 | 104 | 74 | 13 | 7 | 4 | 8 |
| Tex. | 700 | 37 | 5 | - | 9,755 | 10,230 | 492 | 165 | 4 | 37 | 1 | - |
| MOUNTAIN | 305 | 50 | 8 | 1 | 2,557 | 3,734 | 1,139 | 266 | 38 | 67 | 27 | 3 |
| Mont. | 5 | 2 | - | - | 20 | 32 | 41 | 24 | 1 | 3 | 1 | - |
| Idaho | 3 | - | - | - | 40 | 24 | 18 | 30 | - | - | 3 | - |
| Wyo. | 5 | - | - | - | 34 | 43 | 70 | 3 | - | - | - | 3 |
| Colo. | 128 | 17 | 1 | 1 | 436 | 1,047 | 102 | 40 | 10 | 9 | 4 | - |
| N. Mex. | 25 | 6 | - | - | 278 | 281 | 352 | 48 | 5 | 22 | 1 | - |
| Ariz. | 58 | 17 | 7 | - | 1,110 | 1,492 | 371 | 56 | 4 | 28 | 9 | - |
| Utah | 19 | 2 | - | - | 96 | 116 | 91 | 12 | 6 | 5 | 4 | - |
| Nev. | 62 | 6 | - | - | 543 | 699 | 94 | 53 | 12 | - | 5 | - |
| PACIFIC | 2,181 | 204 | 25 | - | 13,036 | 18,076 | 1,752 | 845 | 192 | 122 | 19 | 54 |
| Wash. | 123 | - | - | - | 991 | 1,721 | 161 | 124 | 40 | 7 | 1 | - |
| Oreg. | 53 | - | - | - | 485 | 658 | 102 | 78 | 29 | 2 | 1 | - |
| Calif. | 1,950 | 182 | 25 | - | 11,164 | 15,250 | 1,450 | 620 | 113 | 112 | 16 | 54 |
| Alaska | 5 | 5 | - | - | 200 | 328 | 30 | 8 | 8 | 1 | - | - |
| Hawaii | 50 | 17 | - | - | 196 | 119 | 9 | 15 | 2 | - | 1 | - |
| Guam | - | - | - | - | - | 71 | - | - | - | - | - | - |
| P.R. | 417 | 49 | - | 1 | 105 | 321 | 25 | 109 | 21 | 13 | - | - |
| V.I. | 1 | - | - | - | 136 | 127 | - | 2 | - | - | - | - |
| Amer. Samoa | - | - | - | - | - | 38 | - | - | - | - | - | - |
| C.N.M.I. | - | - | - | - | - | 56 | - | - | - | - | - | - |

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

**TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending March 30, 1991, and March 31, 1990 (13th Week)**

| Reporting Area | Malaria | Measles (Rubeola) | | | | | Menin-gococcal Infections | Mumps | | Pertussis | | | Rubella | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Indigenous | | Imported* | | Total | | | | | | | | | |
| | Cum. 1991 | 1991 | Cum. 1991 | 1991 | Cum. 1991 | Cum. 1990 | Cum. 1991 | 1991 | Cum. 1991 | 1991 | Cum. 1991 | Cum. 1990 | 1991 | Cum. 1991 | Cum. 1990 |
| UNITED STATES | 221 | 446 | 1,721 | 2 | 30 | 4,710 | 601 | 74 | 967 | 40 | 535 | 685 | 11 | 169 | 147 |
| NEW ENGLAND | 13 | 1 | 5 | - | 2 | 102 | 50 | 1 | 11 | 13 | 68 | 86 | - | 1 | 2 |
| Maine | - | - | - | - | - | 27 | 4 | - | - | 7 | 12 | 1 | - | - | - |
| N.H. | 1 | - | - | - | - | 7 | 6 | 1 | 3 | - | 11 | 7 | - | 1 | - |
| Vt. | 1 | 1 | 4 | - | - | 1 | 8 | - | - | - | 1 | 2 | - | - | - |
| Mass. | 7 | - | - | - | - | 2 | 24 | - | - | 5 | 41 | 71 | - | - | - |
| R.I. | 3 | - | - | - | - | 22 | - | - | 2 | - | - | - | - | - | 1 |
| Conn. | 1 | - | 1 | - | 2 | 43 | 8 | - | 6 | 1 | 3 | 5 | - | - | 1 |
| MID. ATLANTIC | 17 | 109 | 660 | - | - | 478 | 58 | 8 | 109 | 3 | 64 | 151 | - | 75 | 2 |
| Upstate N.Y. | 6 | - | 1 | - | - | 229 | 32 | 6 | 41 | 2 | 36 | 117 | - | 68 | 1 |
| N.Y. City | 3 | - | 60 | - | - | 45 | 2 | - | - | - | - | - | - | - | - |
| N.J. | 5 | - | 91 | - | - | 21 | 9 | - | 43 | - | 1 | 11 | - | - | - |
| Pa. | 3 | 109 | 508 | - | - | 183 | 15 | 2 | 25 | 1 | 27 | 23 | - | 7 | 1 |
| E.N. CENTRAL | 20 | 7 | 27 | - | 2 | 2,053 | 89 | 5 | 72 | 3 | 92 | 188 | - | 6 | 14 |
| Ohio | 5 | - | - | - | 1 | 210 | 29 | - | - | - | 34 | 26 | - | - | - |
| Ind. | 2 | - | - | - | - | 119 | 11 | - | 3 | 1 | 20 | 31 | - | 1 | - |
| Ill. | 6 | - | - | - | - | 867 | 23 | - | 35 | - | 15 | 68 | - | 2 | 13 |
| Mich. | 7 | 7 | 25 | - | - | 294 | 21 | 5 | 31 | 2 | 19 | 27 | - | 3 | - |
| Wis. | - | - | 2 | - | 1 | 563 | 5 | - | 3 | - | 4 | 36 | - | - | 1 |
| W.N. CENTRAL | 5 | 1 | 3 | - | 1 | 104 | 26 | - | 39 | 4 | 39 | 22 | 1 | 4 | - |
| Minn. | - | - | 1 | - | 1 | 28 | 7 | - | 2 | 4 | 15 | - | 1 | 3 | - |
| Iowa | 2 | 1 | 2 | - | - | 21 | 2 | - | 7 | - | 4 | 3 | - | - | - |
| Mo. | 3 | - | - | - | - | 51 | 11 | - | 5 | - | 14 | 14 | - | 1 | - |
| N. Dak. | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - |
| S. Dak. | - | - | - | - | - | - | 1 | - | - | - | 1 | 1 | - | - | - |
| Nebr. | - | - | - | - | - | 1 | 3 | - | 3 | - | 4 | 1 | - | - | - |
| Kans. | - | - | - | - | - | 3 | 2 | - | 22 | - | 1 | 2 | - | - | - |
| S. ATLANTIC | 53 | 43 | 158 | - | 8 | 264 | 108 | 23 | 334 | - | 32 | 57 | - | 8 | 9 |
| Del. | 1 | 3 | 11 | - | - | 4 | - | - | 2 | - | - | 2 | - | - | - |
| Md. | 17 | 22 | 56 | - | - | 28 | 13 | 2 | 83 | - | 6 | 19 | - | 8 | - |
| D.C. | 4 | - | - | - | - | 3 | - | 1 | 5 | - | - | 1 | - | - | - |
| Va. | 8 | 5 | 12 | - | 2 | 19 | 11 | 1 | 19 | - | 4 | 7 | - | - | - |
| W. Va. | 1 | - | - | - | - | 6 | 4 | - | 8 | - | 6 | 5 | - | - | - |
| N.C. | 1 | - | - | - | - | 3 | 25 | 8 | 73 | - | 7 | 9 | - | - | - |
| S.C. | 4 | - | 12 | - | - | 1 | 17 | 6 | 49 | - | - | 3 | - | - | - |
| Ga. | 5 | - | - | - | - | 6 | 19 | - | 12 | - | 6 | 7 | - | - | - |
| Fla. | 12 | 13 | 67 | - | 6 | 194 | 19 | 5 | 83 | - | 3 | 4 | - | - | 9 |
| E.S. CENTRAL | 2 | - | 4 | - | - | 44 | 52 | - | 24 | 4 | 19 | 25 | - | - | 1 |
| Ky. | 1 | - | - | - | - | 2 | 22 | - | - | - | - | - | - | - | - |
| Tenn. | - | - | 4 | - | - | 17 | 17 | - | 12 | 2 | 10 | 12 | - | - | 1 |
| Ala. | 1 | - | - | - | - | 4 | 13 | - | 2 | 2 | 9 | 11 | - | - | - |
| Miss. | - | - | - | - | - | 21 | - | - | 10 | - | - | 2 | - | - | - |
| W.S. CENTRAL | 12 | - | - | - | 5 | 416 | 39 | 3 | 123 | 1 | 13 | 7 | - | 1 | - |
| Ark. | 1 | - | - | - | 5 | 1 | 7 | 1 | 20 | - | - | 1 | - | 1 | - |
| La. | 2 | - | - | - | - | - | 13 | - | 9 | - | 7 | 1 | - | - | - |
| Okla. | 1 | - | - | - | - | 53 | 4 | - | 1 | 1 | 6 | 5 | - | - | - |
| Tex. | 8 | - | - | - | - | 362 | 15 | 2 | 93 | - | - | - | - | - | - |
| MOUNTAIN | 9 | 47 | 150 | 1 | 9 | 160 | 27 | 10 | 55 | 4 | 81 | 69 | - | 1 | 8 |
| Mont. | 1 | - | - | - | - | 1 | 4 | - | - | - | - | - | - | - | 5 |
| Idaho | - | - | - | 1§ | 2 | 7 | 5 | 1 | 3 | - | 17 | 6 | - | - | 3 |
| Wyo. | - | - | - | - | - | - | 1 | 1 | 3 | - | 3 | - | - | - | - |
| Colo. | 3 | - | - | - | 1 | 14 | 4 | 3 | 16 | 4 | 31 | 46 | - | - | - |
| N. Mex. | 1 | - | 71 | - | 2 | 48 | 4 | N | N | - | 12 | 3 | - | - | - |
| Ariz. | 4 | 46 | 71 | - | - | 66 | 5 | 3 | 23 | - | 8 | 7 | - | - | - |
| Utah | - | - | - | - | 4 | - | - | - | 8 | - | 10 | 3 | - | - | - |
| Nev. | - | 1 | 8 | - | - | 24 | 4 | 2 | 2 | - | - | 4 | - | 1 | - |
| PACIFIC | 90 | 238 | 714 | 1 | 3 | 1,089 | 152 | 24 | 200 | 8 | 127 | 80 | 10 | 73 | 111 |
| Wash. | 6 | - | - | - | - | 39 | 15 | 13 | 53 | 7 | 29 | 24 | - | - | - |
| Oreg. | 2 | 2 | 7 | - | - | 98 | 15 | N | N | 1 | 21 | 7 | - | - | - |
| Calif. | 80 | 236 | 703 | 1† | 3 | 903 | 118 | 10 | 136 | - | 54 | 43 | 10 | 72 | 107 |
| Alaska | - | - | - | - | - | 47 | 4 | - | 4 | - | 4 | - | - | - | - |
| Hawaii | 2 | - | 4 | - | - | 2 | - | 1 | 7 | - | 19 | 6 | - | 1 | 4 |
| Guam | - | U | - | U | - | - | - | U | - | U | - | - | U | - | - |
| P.R. | - | U | - | U | 1 | 300 | 11 | U | 5 | U | 6 | 4 | U | 1 | - |
| V.I. | - | U | - | U | - | - | - | U | 3 | U | - | - | U | - | - |
| Amer. Samoa | - | U | - | U | - | - | - | U | - | U | - | - | U | - | - |
| C.N.M.I. | - | U | - | U | - | - | - | U | - | U | - | - | U | - | - |

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

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

**TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending March 30, 1991, and March 31, 1990 (13th Week)**

| Reporting Area | Syphilis (Primary & Secondary) | | Toxic-shock Syndrome | Tuberculosis | | Tula-remia | Typhoid Fever | Typhus Fever (Tick-borne) (RMSF) | Rabies, Animal |
|---|---|---|---|---|---|---|---|---|---|
| | Cum. 1991 | Cum. 1990 | Cum. 1991 | Cum. 1991 | Cum. 1990 | Cum. 1991 | Cum. 1991 | Cum. 1991 | Cum. 1991 |
| UNITED STATES | 10,364 | 12,167 | 88 | 4,484 | 5,075 | 18 | 72 | 15 | 1,045 |
| NEW ENGLAND | 279 | 492 | 6 | 113 | 95 | - | 6 | 2 | 1 |
| Maine | - | 5 | 3 | - | - | - | - | - | - |
| N.H. | 3 | 29 | 1 | - | 1 | - | - | - | 1 |
| Vt. | 1 | 1 | - | 1 | 2 | - | - | - | - |
| Mass. | 142 | 173 | 2 | 53 | 41 | - | 6 | 2 | - |
| R.I. | 14 | 1 | - | 16 | 22 | - | - | - | - |
| Conn. | 119 | 283 | - | 43 | 29 | - | - | - | - |
| MID. ATLANTIC | 1,666 | 2,613 | 13 | 1,035 | 1,235 | - | 10 | - | 350 |
| Upstate N.Y. | 103 | 161 | 7 | 50 | 122 | - | 4 | - | 113 |
| N.Y. City | 733 | 1,348 | - | 679 | 753 | - | 2 | - | - |
| N.J. | 325 | 394 | - | 198 | 181 | - | 4 | - | 157 |
| Pa. | 505 | 710 | 6 | 108 | 179 | - | - | - | 80 |
| E.N. CENTRAL | 1,030 | 826 | 16 | 536 | 475 | 1 | 7 | - | 15 |
| Ohio | 155 | 128 | 11 | 78 | 62 | - | 1 | - | 3 |
| Ind. | 26 | 7 | - | 28 | 32 | - | - | - | - |
| Ill. | 396 | 300 | 2 | 304 | 244 | - | - | - | 3 |
| Mich. | 317 | 285 | 3 | 96 | 121 | 1 | 5 | - | 2 |
| Wis. | 136 | 106 | - | 30 | 16 | - | 1 | - | 7 |
| W.N. CENTRAL | 173 | 110 | 17 | 128 | 116 | 3 | 2 | - | 134 |
| Minn. | 19 | 32 | 7 | 23 | 21 | - | 2 | - | 51 |
| Iowa | 18 | 10 | 5 | 23 | 13 | - | - | - | 27 |
| Mo. | 107 | 44 | 4 | 51 | 48 | 3 | - | - | 3 |
| N. Dak. | - | 1 | - | 2 | 6 | - | - | - | 13 |
| S. Dak. | 1 | - | - | 11 | 4 | - | - | - | 29 |
| Nebr. | 1 | 3 | 1 | 4 | 10 | - | - | - | 5 |
| Kans. | 27 | 20 | - | 14 | 14 | - | - | - | 6 |
| S. ATLANTIC | 3,183 | 3,759 | 5 | 790 | 922 | 1 | 13 | 10 | 285 |
| Del. | 39 | 54 | 1 | 7 | 14 | - | - | - | 40 |
| Md. | 266 | 300 | - | 71 | 80 | - | 5 | 1 | 108 |
| D.C. | 162 | 197 | - | 46 | 28 | - | 1 | - | 5 |
| Va. | 267 | 215 | 1 | 76 | 82 | - | 3 | - | 49 |
| W. Va. | 4 | 4 | - | 24 | 16 | - | 1 | - | 20 |
| N.C. | 498 | 446 | 3 | 95 | 109 | - | - | 8 | - |
| S.C. | 394 | 214 | - | 91 | 116 | - | - | - | 19 |
| Ga. | 788 | 851 | - | 163 | 141 | - | 2 | 1 | 38 |
| Fla. | 765 | 1,478 | - | 217 | 336 | 1 | 1 | - | 6 |
| E.S. CENTRAL | 1,122 | 1,098 | 3 | 310 | 421 | 2 | - | 2 | 27 |
| Ky. | 22 | 20 | 1 | 78 | 96 | 1 | - | 1 | 6 |
| Tenn. | 448 | 448 | 2 | 42 | 132 | 1 | - | - | 8 |
| Ala. | 369 | 345 | - | 101 | 126 | - | - | 1 | 13 |
| Miss. | 283 | 285 | - | 89 | 67 | - | - | - | - |
| W.S. CENTRAL | 1,949 | 1,921 | 4 | 414 | 614 | 6 | 1 | 1 | 124 |
| Ark. | 69 | 127 | 2 | 42 | 62 | 4 | - | - | 10 |
| La. | 616 | 558 | - | 20 | 113 | - | 1 | - | 3 |
| Okla. | 41 | 56 | 2 | 15 | 44 | 2 | - | 1 | 49 |
| Tex. | 1,223 | 1,180 | - | 337 | 395 | - | - | - | 62 |
| MOUNTAIN | 159 | 224 | 10 | 122 | 107 | 4 | 3 | - | 12 |
| Mont. | 1 | - | - | - | 4 | 3 | - | - | 5 |
| Idaho | 3 | 4 | - | 2 | 1 | - | - | - | 1 |
| Wyo. | 1 | 1 | - | 2 | 1 | 1 | - | - | 2 |
| Colo. | 15 | 16 | 1 | 6 | 6 | - | - | - | 1 |
| N. Mex. | 8 | 16 | 3 | 10 | 23 | - | - | - | 1 |
| Ariz. | 112 | 146 | 3 | 78 | 51 | - | 2 | - | 2 |
| Utah | 3 | 2 | 3 | 13 | 3 | - | - | - | - |
| Nev. | 16 | 39 | - | 11 | 18 | - | 1 | - | - |
| PACIFIC | 803 | 1,124 | 14 | 1,036 | 1,090 | 1 | 30 | - | 97 |
| Wash. | 33 | 114 | 1 | 65 | 65 | 1 | - | - | - |
| Oreg. | 25 | 28 | - | 26 | 29 | - | 1 | - | 1 |
| Calif. | 742 | 966 | 13 | 882 | 936 | - | 28 | - | 93 |
| Alaska | 2 | 5 | - | 12 | 17 | - | - | - | 3 |
| Hawaii | 1 | 11 | - | 51 | 43 | - | 1 | - | - |
| Guam | - | - | - | - | 12 | - | - | - | - |
| P.R. | 75 | 128 | - | 38 | 29 | - | - | - | 7 |
| V.I. | 35 | 1 | - | 1 | 2 | - | - | - | - |
| Amer. Samoa | - | - | - | - | 5 | - | - | - | - |
| C.N.M.I. | - | - | - | - | 10 | - | - | - | - |

U: Unavailable

## TABLE III. Deaths in 121 U.S. cities,* week ending March 30, 1991 (13th Week)

| Reporting Area | All Causes, By Age (Years) | | | | | | P&I** |
|---|---|---|---|---|---|---|---|
| | All Ages | ≥65 | 45-64 | 25-44 | 1-24 | <1 | Total |
| NEW ENGLAND | 665 | 477 | 120 | 40 | 14 | 13 | 67 |
| Boston, Mass. | 191 | 124 | 33 | 17 | 7 | 9 | 20 |
| Bridgeport, Conn. | 37 | 23 | 9 | 5 | - | - | 1 |
| Cambridge, Mass. | 20 | 16 | 4 | - | - | - | 1 |
| Fall River, Mass. | 28 | 25 | 3 | - | - | - | - |
| Hartford, Conn. | 47 | 28 | 14 | 2 | 2 | 1 | 2 |
| Lowell, Mass. | 27 | 20 | 6 | 1 | - | - | 5 |
| Lynn, Mass. | 10 | 6 | 4 | - | - | - | - |
| New Bedford, Mass. | 24 | 21 | 2 | - | 1 | - | 1 |
| New Haven, Conn. | 45 | 30 | 9 | 4 | 1 | 1 | 4 |
| Providence, R.I. | 73 | 60 | 6 | 4 | 2 | 1 | 10 |
| Somerville, Mass. | 7 | 5 | 1 | 1 | - | - | - |
| Springfield, Mass. | 34 | 28 | 5 | 1 | - | - | 5 |
| Waterbury, Conn. | 31 | 25 | 5 | 1 | - | - | 2 |
| Worcester, Mass. | 91 | 66 | 19 | 4 | 1 | 1 | 16 |
| MID. ATLANTIC | 2,857 | 1,792 | 572 | 302 | 89 | 100 | 103 |
| Albany, N.Y. | 52 | 30 | 13 | 2 | 2 | 5 | 6 |
| Allentown, Pa. | 21 | 17 | 3 | 1 | - | - | 1 |
| Buffalo, N.Y. | 100 | 70 | 20 | 6 | 1 | 3 | 3 |
| Camden, N.J. | 32 | 16 | 10 | 3 | 2 | 1 | 1 |
| Elizabeth, N.J. | 20 | 16 | 3 | 1 | - | - | 3 |
| Erie, Pa.† | 52 | 42 | 7 | 2 | 1 | - | 1 |
| Jersey City, N.J. | 50 | 37 | 8 | 4 | - | 1 | 2 |
| New York City, N.Y. | 1,408 | 848 | 299 | 178 | 51 | 32 | - |
| Newark, N.J. | 69 | 19 | 26 | 14 | 8 | 1 | 8 |
| Paterson, N.J. | 18 | 12 | 3 | 2 | - | 1 | 1 |
| Philadelphia, Pa. | 527 | 303 | 109 | 58 | 15 | 41 | 31 |
| Pittsburgh, Pa.† | 71 | 51 | 9 | 5 | 3 | 3 | 5 |
| Reading, Pa. | 40 | 31 | 5 | 3 | - | 1 | 7 |
| Rochester, N.Y. | 140 | 99 | 25 | 10 | 1 | 5 | 13 |
| Schenectady, N.Y. | 22 | 19 | 2 | 1 | - | - | 4 |
| Scranton, Pa.† | 37 | 30 | 6 | 1 | - | - | 1 |
| Syracuse, N.Y. | 121 | 90 | 18 | 6 | 4 | 3 | 6 |
| Trenton, N.J. | 37 | 24 | 5 | 4 | 1 | 3 | 6 |
| Utica, N.Y. | 16 | 15 | - | 1 | - | - | 2 |
| Yonkers, N.Y. | 24 | 23 | 1 | - | - | - | 2 |
| E.N. CENTRAL | 1,974 | 1,239 | 401 | 176 | 96 | 62 | 128 |
| Akron, Ohio | 71 | 51 | 9 | 4 | 5 | 2 | 3 |
| Canton, Ohio | 39 | 29 | 9 | 1 | - | - | 6 |
| Chicago, Ill. | 332 | 131 | 75 | 69 | 43 | 14 | 7 |
| Cincinnati, Ohio | 112 | 71 | 22 | 9 | 4 | 6 | 10 |
| Cleveland, Ohio | 120 | 74 | 28 | 6 | 2 | 10 | 1 |
| Columbus, Ohio | 159 | 101 | 34 | 15 | 6 | 3 | 4 |
| Dayton, Ohio | 119 | 86 | 19 | 9 | 4 | 1 | 10 |
| Detroit, Mich. | 217 | 133 | 43 | 23 | 10 | 8 | 6 |
| Evansville, Ind. | 40 | 27 | 9 | 1 | 2 | 1 | - |
| Fort Wayne, Ind. | 48 | 34 | 11 | 2 | 1 | - | 3 |
| Gary, Ind. | 12 | 6 | 3 | 1 | 2 | - | - |
| Grand Rapids, Mich. | 87 | 59 | 15 | 6 | 3 | 4 | 8 |
| Indianapolis, Ind. | 144 | 91 | 32 | 9 | 6 | 6 | 16 |
| Madison, Wis. | 47 | 34 | 8 | 2 | 2 | 1 | 5 |
| Milwaukee, Wis. | 100 | 77 | 22 | 1 | - | - | 16 |
| Peoria, Ill. | 38 | 30 | 4 | 4 | - | - | 3 |
| Rockford, Ill. | 42 | 27 | 12 | 3 | - | - | 7 |
| South Bend, Ind. | 45 | 32 | 8 | 3 | 1 | 1 | 6 |
| Toledo, Ohio | 153 | 108 | 29 | 8 | 3 | 5 | 13 |
| YOUNGSTOWN OHIO | 49 | 38 | 9 | - | 2 | - | 4 |
| W.N. CENTRAL | 886 | 639 | 143 | 66 | 20 | 17 | 72 |
| Des Moines, Iowa | 94 | 69 | 16 | 7 | 2 | - | 13 |
| Duluth, Minn. | 31 | 24 | 6 | 1 | - | - | - |
| Kansas City, Kans. | 27 | 20 | 5 | 1 | 1 | - | 1 |
| Kansas City, Mo. | 122 | 83 | 17 | 12 | 6 | 4 | 6 |
| Lincoln, Nebr. | 34 | 23 | 7 | 3 | - | 1 | 6 |
| Minneapolis, Minn. | 233 | 174 | 34 | 15 | 5 | 5 | 26 |
| Omaha, Nebr. | 72 | 52 | 14 | 4 | 1 | 1 | 5 |
| St. Louis, Mo. | 142 | 100 | 21 | 17 | 3 | 1 | 7 |
| St. Paul, Minn. | 65 | 45 | 11 | 3 | 2 | 4 | 5 |
| S. ATLANTIC | 1,159 | 723 | 242 | 117 | 35 | 41 | 77 |
| Atlanta, Ga. | 155 | 84 | 45 | 15 | 8 | 3 | 5 |
| Baltimore, Md. | 225 | 129 | 45 | 35 | 3 | 13 | 23 |
| Charlotte, N.C. | 75 | 50 | 15 | 5 | 2 | 3 | 6 |
| Jacksonville, Fla. | 114 | 71 | 25 | 10 | 7 | 1 | 7 |
| Miami, Fla. | 109 | 55 | 21 | 23 | 7 | 3 | 1 |
| Norfolk, Va. | 60 | 38 | 10 | 4 | 1 | 7 | - |
| Richmond, Va. | 110 | 75 | 20 | 9 | 4 | 2 | 9 |
| Savannah, Ga. | 46 | 29 | 12 | 4 | - | 1 | 8 |
| St. Petersburg, Fla. | 82 | 67 | 7 | 3 | 1 | 4 | 4 |
| Tampa, Fla. | 161 | 109 | 36 | 9 | 2 | 4 | 14 |
| Washington, D.C.§ | U | U | U | U | U | U | U |
| Wilmington, Del. | 22 | 16 | 6 | - | - | - | - |
| E.S. CENTRAL | 970 | 646 | 183 | 75 | 26 | 40 | 60 |
| Birmingham, Ala. | 151 | 87 | 32 | 16 | 7 | 9 | 6 |
| Chattanooga, Tenn. | 38 | 22 | 10 | 3 | 2 | 1 | 5 |
| Knoxville, Tenn. | 74 | 61 | 7 | 3 | - | 3 | 9 |
| Louisville, Ky. | 56 | 41 | 10 | 5 | - | - | 6 |
| Memphis, Tenn. | 185 | 121 | 31 | 14 | 9 | 10 | 9 |
| Mobile, Ala. | 307 | 208 | 62 | 20 | 5 | 12 | 19 |
| Montgomery, Ala. | 33 | 23 | 6 | 3 | - | 1 | 2 |
| Nashville, Tenn. | 126 | 83 | 25 | 11 | 3 | 4 | 4 |
| W.S. CENTRAL | 1,418 | 890 | 301 | 135 | 60 | 32 | 108 |
| Austin, Tex. | 81 | 50 | 17 | 8 | 5 | 1 | 11 |
| Baton Rouge, La. | 45 | 30 | 12 | 1 | 1 | 1 | 2 |
| Corpus Christi, Tex. | 45 | 32 | 6 | 3 | 4 | - | 2 |
| Dallas, Tex. | 197 | 116 | 38 | 29 | 11 | 3 | 3 |
| El Paso, Tex. | 39 | 28 | 8 | 1 | 2 | - | 2 |
| Ft. Worth, Tex. | 113 | 71 | 27 | 7 | 3 | 5 | 6 |
| Houston, Tex. | 358 | 205 | 84 | 45 | 13 | 11 | 38 |
| Little Rock, Ark. | 90 | 62 | 15 | 7 | 3 | 3 | 2 |
| New Orleans, La. | 106 | 67 | 21 | 12 | 6 | - | - |
| San Antonio, Tex. | 190 | 119 | 43 | 16 | 8 | 4 | 18 |
| Shreveport, La. | 64 | 49 | 11 | 3 | - | 1 | 12 |
| Tulsa, Okla. | 90 | 61 | 19 | 3 | 4 | 3 | 12 |
| MOUNTAIN | 761 | 496 | 152 | 63 | 26 | 24 | 66 |
| Albuquerque, N.M. | 102 | 76 | 13 | 8 | 4 | 1 | 9 |
| Colo. Springs, Colo. | 54 | 37 | 11 | 3 | 2 | 1 | 9 |
| Denver, Colo. | 125 | 88 | 21 | 10 | 2 | 4 | 16 |
| Las Vegas, Nev. | 118 | 67 | 32 | 10 | 8 | 1 | 10 |
| Ogden, Utah | 27 | 18 | 4 | 2 | 2 | 1 | 2 |
| Phoenix, Ariz. | 160 | 98 | 28 | 22 | 6 | 6 | 3 |
| Pueblo, Colo. | 25 | 17 | 7 | 1 | - | - | 3 |
| Salt Lake City, Utah | 35 | 15 | 8 | 2 | 2 | 8 | 3 |
| Tucson, Ariz. | 115 | 80 | 28 | 5 | - | 2 | 11 |
| PACIFIC | 2,268 | 1,516 | 407 | 216 | 63 | 51 | 151 |
| Berkeley, Calif. | 29 | 19 | 5 | 4 | - | - | 3 |
| Fresno, Calif. | 118 | 77 | 27 | 4 | 4 | 6 | 8 |
| Glendale, Calif. | 32 | 24 | 5 | 1 | - | 2 | 2 |
| Honolulu, Hawaii | 92 | 65 | 11 | 8 | 2 | 6 | 9 |
| Long Beach, Calif. | 75 | 58 | 11 | 3 | 1 | 2 | 13 |
| Los Angeles, Calif. | 785 | 507 | 140 | 85 | 29 | 10 | 34 |
| Oakland, Calif.§ | U | U | U | U | U | U | U |
| Pasadena, Calif. | 34 | 29 | 1 | 1 | 3 | - | 3 |
| Portland, Oreg. | 119 | 88 | 17 | 7 | 4 | 3 | 5 |
| Sacramento, Calif. | 151 | 108 | 30 | 11 | - | 2 | 17 |
| San Diego, Calif. | 137 | 85 | 27 | 18 | 4 | 3 | 10 |
| San Francisco, Calif. | 175 | 92 | 39 | 35 | 5 | 4 | 10 |
| San Jose, Calif. | 194 | 130 | 37 | 16 | 3 | 8 | 16 |
| Seattle, Wash. | 167 | 113 | 33 | 14 | 3 | 4 | 6 |
| Spokane, Wash. | 74 | 53 | 15 | 3 | 2 | 1 | 9 |
| Tacoma, Wash. | 86 | 68 | 9 | 6 | 3 | - | 6 |
| TOTAL | 12,958 | ††8,418 | 2,521 | 1,190 | 429 | 380 | 832 |

*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.

§Report for this week is unavailable (U).

*AIDS – Continued*

young age (mean: 28.5 years) of Italians diagnosed with AIDS (*1*) (which suggests that most became infected as teenagers), more effective IV-drug education is urgently needed.

In this survey, the percentage of students who reported having had sexual intercourse was considerably lower than that reported in other European countries and in the United States (*6–8*), although it is consistent with findings of other studies in Italy (*9*). The frequency of multiple sex partners also was lower than that reported in the United States. Although lower than in some countries, the proportion of sexually active teenagers nonetheless underscores the need for additional sex education.

Although a high percentage of students knew that condoms may protect against AIDS, routine use of condoms among sexually active teenagers was relatively low—a finding of particular concern for females. In view of the greater risk for heterosexual transmission from males to females than from females to males (*10*), levels of awareness about risk for HIV infection must be increased among females.

Only a small percentage of students reported having obtained AIDS information from school. However, attempts have been initiated to increase the role of schools in education about HIV infection and AIDS. In several regions in Italy, innovative HIV/AIDS education programs have begun in the schools. In addition, under the auspices of the Ministry of Education and the National AIDS Committee National Training Program for HIV Infection at the Istituto Superiore di Sanita, week-long workshops that involve participation of local authorities in the development of appropriate teaching materials and curricula are being held throughout Italy.

*References*


1. AIDS Task Force. Summary of AIDS cases notified in Italy as of December 31, 1990. Rome, Italy: Istituto Superiore di Sanita, 1991.
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## Nutritional Assessment of Children in Drought-Affected Areas – Haiti, 1990

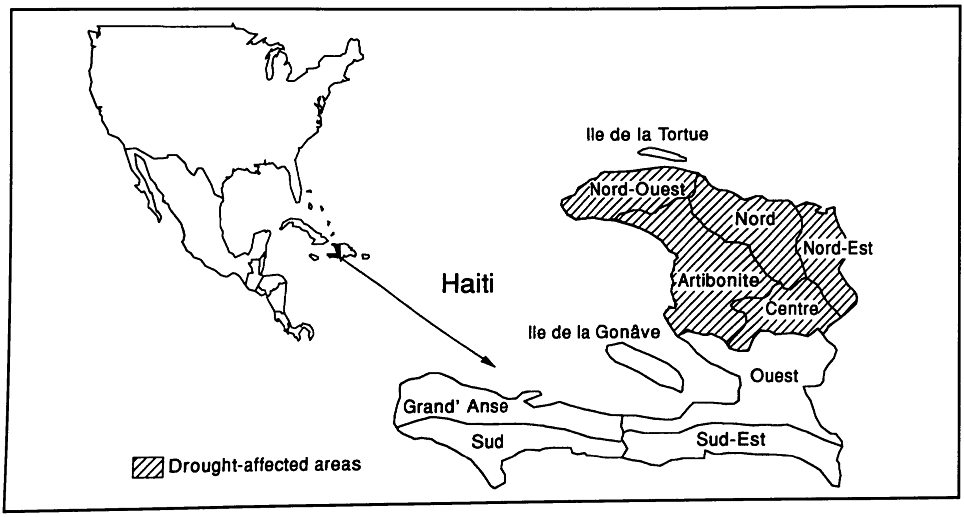
From January through June 1990, a drought occurred in the Caribbean nation of Haiti. To determine whether the nutritional status of young children had been affected by drought-related reductions in food supply, in September 1990 a nutrition survey was conducted in the five departments most affected (Nord-Ouest, Nord, Nord-Est, Artibonite, and Centre) of Haiti's nine departments (Figure 1).

A multistage 30-cluster survey was conducted using sampling methods modified from the CDC rapid nutrition assessment surveys procedure (*1*) because of limitations in population estimates. A preliminary weighted analysis of prevalence and confidence intervals was performed using SESUDAAN, a computer software program for analyzing complex sample survey data (*2*). The Epi Info version 5.0 (*3*) nutritional anthropometry computer software program was used to calculate height-for-age (Ht/Age), weight-for-height (Wt/Ht), and weight-for-age (Wt/Age) z-scores; percentiles; and percentages of median values.

The growth status of 967 children aged 3.0–59.9 months was evaluated to estimate the prevalence of low Ht/Age (an indicator of chronic undernutrition), low Wt/Ht (an indicator of acute undernutrition), and low Wt/Age (*4*). A cutoff point of <–2 standard deviation units from CDC's National Center for Health Statistics/World Health Organization (CDC/WHO) reference median (z-score <–2, or the 2.3rd percentile) was used to classify low Ht/Age, low Wt/Ht, and low Wt/Age (*5*).

The overall prevalences of low Ht/Age and Wt/Ht among the children surveyed was 40.6% and 4.2%, respectively (Table 1). The prevalence of low Wt/Ht was higher among children aged 12.0–23.9 months; however, this is partially accounted for by a disjunction in the CDC/WHO growth reference curve that results in an overestimation of the prevalence of low Wt/Ht for this age group (*6*). Approximately 34% of all children surveyed had low Wt/Age.

**FIGURE 1. Drought-affected areas – Haiti, 1990**



*Nutritional Assessment — Continued*

When compared with the CDC/WHO reference population, the z-score curves for Ht/Age and Wt/Age in Haitian children aged 24.0–59.9 months were dispersed (Figure 2). The Wt/Age distribution for Haitian children indicated the high prevalence of low Ht/Age rather than low Wt/Ht (Figure 2). In addition, the entire distributions of Ht/Age and Wt/Age were shifted to the left of the reference by nearly 1.8 z-score units, indicating that chronic undernutrition was prevalent and generalized among young children in the drought-affected areas of northern Haiti.

*Reported by: Child Health Institute of Haiti; Ministry of Health of Haiti. US Agency for International Development/Haiti. Pan American Health Organization/World Health Organization. Div of Nutrition, Center for Chronic Disease Prevention and Health Promotion; Technical Support Div, International Health Program Office, CDC.*

**Editorial Note:** When compared with the prevalence of undernutrition in other less developed countries (*7*), the prevalence of chronic undernutrition in Haiti was moderate to high (Table 1). Long-term protein-energy deprivation is a major cause of chronic undernutrition in children; however, recurrent infections and micronutrient deficiencies can also contribute to growth retardation (*8*). The estimated prevalence of low Wt/Ht represented a moderate level of acute undernutrition when compared with the prevalence of low Wt/Ht in other less developed countries (*7*). Unlike low Ht/Age, a >10% prevalence of low Wt/Ht is regarded as a severe condition, often observed during famines.

Although not directly comparable, the prevalence estimates from this survey are similar to estimates obtained from the 1978 Haiti Nutrition Status Survey (*9*). However, because of the 12-year lapse between the two surveys, it is not possible to determine whether the situation was stable, better, or worse during the last few years. Data from ongoing surveillance or frequent surveys are necessary to determine secular trends in nutritional status.

The 1990 survey results do not suggest a famine situation existed in Haiti. However, because low or abnormal anthropometric findings are a late indicator of inadequate nutrition and because the present anthropometric data indicate a moderately malnourished population, the results of the survey indicate that the population had little reserve capacity to withstand food shortages and that any further

**TABLE 1. Age-specific prevalence* of undernutrition in drought-affected areas — northern departments of Haiti, September 1990**

| | Height/Age <–2 SD† | | Weight/Height <–2 SD | | Weight/Age <–2 SD | |
|---|---|---|---|---|---|---|
| **Age (mos)** | **Prevalence (%)** | **95% CI§** | **Prevalence (%)** | **95% CI** | **Prevalence (%)** | **95% CI** |
| 3.0– 5.9 | 2.8 | 0.0– 6.4 | 0.0 | 0.0– 0.0 | 2.3 | 0.0– 6.0 |
| 6.0–11.9 | 12.4 | 4.7–20.2 | 1.4 | 0.0– 3.0 | 15.8 | 8.3–23.3 |
| 12.0–23.9 | 43.4 | 24.4–62.4 | 8.1 | 2.2–14.0 | 32.3 | 21.6–43.0 |
| 24.0–35.9 | 47.1 | 36.3–57.9 | 5.9 | 1.4–10.4 | 42.2 | 33.4–51.0 |
| 36.0–47.9 | 43.4 | 35.8–50.5 | 2.5 | 0.4– 4.7 | 30.7 | 20.8–40.5 |
| 48.0–59.9 | 47.1 | 45.4–78.1 | 3.5 | 0.0– 7.6 | 54.6 | 32.8–76.4 |
| **Total** | **40.6** | **32.1–49.0** | **4.2** | **1.2– 7.3** | **33.9** | **26.4–41.3** |

*Weighted prevalence estimates.
†Standard deviation from CDC's National Center for Health Statistics/World Health Organization reference median.
§Confidence interval.

*Nutritional Assessment — Continued*

deterioration of nutritional status could result in increased morbidity and mortality. Recommended nutrition interventions to prevent the emergence of such a crisis include increasing food availability and consumer purchasing power and providing seeds to farmers. The immediate distribution of food to high-risk persons (e.g., young children and pregnant women) and the establishment of a reliable system for monitoring nutritional levels in areas considered at risk are additional options.

In consultation with Haitian public health officials and relief organizations, CDC assisted in developing a sentinel nutrition surveillance system that includes the monthly collection of information on rainfall patterns, agricultural production, food prices, and child weight. Data from this system are being analyzed in Haiti and should contribute to a famine early-warning system for the country.

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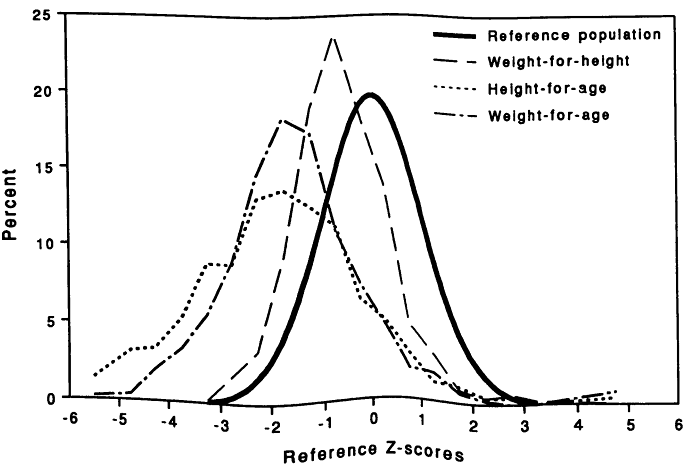
**FIGURE 2. Anthropometry of Haitian children aged 24.0–59.9 months compared with CDC's National Center for Health Statistics/World Health Organization reference population — northern departments of Haiti, 1990**



*Nutritional Assessment — Continued*

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## Update: Cholera Outbreak — Peru, Ecuador, and Colombia

*The following report is reprinted from the* Weekly Epidemiological Record *of the World Health Organization (WHO). The editorial note was prepared by CDC.*

### SMALL RISK OF CHOLERA TRANSMISSION BY FOOD IMPORTS

WHO has no documented evidence of a cholera outbreak occurring as a result of the importation of food across international borders.

- *Dried, acidic and pickled foods, fruit juices:* cholera organisms are sensitive to drying and to acidity (pH <4.5); therefore, these foods and juices are unlikely to cause infection.
- *Coffee, cereals:* same as for dried foods above.
- *Frozen foods:* freezing below –20°C will reduce, but may not completely eliminate, cholera organisms from food.
- *Canned foods:* canned foods produced according to the relevant Codex standard* are free of cholera organisms even if the raw product was contaminated.
- *Irradiated foods:* irradiated foods produced according to the relevant Codex standard† and which have received a dose of at least 1kGy are free of cholera organisms even if the raw product was contaminated.
- *Fresh sea food:* sea food from shallow coastal waters (such as prawns and shellfish) may be contaminated. It should be properly cooked as shown below. Deep sea fish are unlikely to have been infected in their habitat, but could become contaminated during subsequent handling.
- *Fresh vegetables and fruit:* these may be surface contaminated and may remain so up to a maximum of 10 days.
- *Animal feeds:* since there is no known reservoir of cholera in poultry or livestock, animal feeds, and in particular *dried fish meal,* do not pose a risk of transmission.

Cholera transmission through food can be eliminated by thorough cooking (core temperature 70°C), and by prevention of contamination of cooked foods by contact with raw foods or infected food handlers. Refrigeration prevents multiplication of the cholera organism but may prolong its survival. Fruit from which the peel can be removed should also be safe.

If national authorities are concerned about the importation of any product, they are urged to consult with the World Health Organization, Food Safety unit, 1211 Geneva

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*Recommended International Code of Practice for Low-Acid and Acidified Low-Acid Canned Food, *Codex Alimentarius* Vol. G, FAO/WHO 1983.

†Codex General Standard for Irradiated Foods, and Recommended International Code of Practice for the Operation of Radiation Facilities used for the Treatment of Foods, *Codex Alimentarius* Vol. XV, FAO/WHO 1984.

*Cholera – Continued*

27, Switzerland, or with the Pan American Health Organization, Program Coordinator, HST, 525 Twenty-Third Street, NW, Washington, DC 20037-2897, United States of America (Fax [202] 223-5971).

Countries are reminded that cholera vaccine is *not* recommended as a measure for prevention or control and they should *not* require it from persons entering or leaving infected countries. On no account should the travel of people across frontiers be restricted because of cholera.

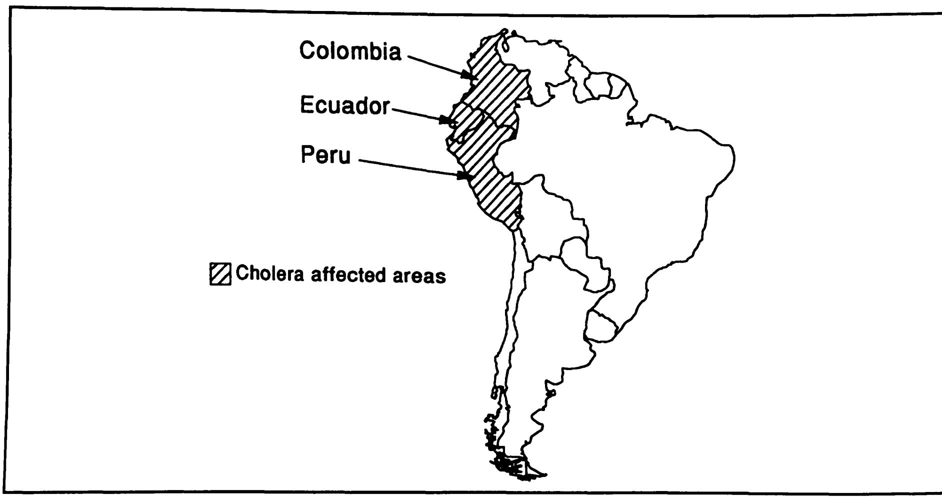
*Reprinted from: World Health Organization.* Weekly Epidemiological Record *1991;66:55–6.*
*Reported by: Enteric Diseases Br, Div of Bacterial and Mycotic Diseases, Center for Infectious Diseases, CDC.*

**Editorial Note:** In late January 1991, cholera appeared in South America for the first time this century (*1*). It was first identified in Peru and has now spread to Ecuador and Colombia (Figure 1). Because all three countries export food, there has been concern that food from these countries might infect consumers. WHO published the above report to respond to this concern; CDC concurs with the statements in the WHO report.

The duration of survival of *Vibrio cholerae* O1 in food is affected by several factors, including pH, humidity, temperature, and inoculum size. Many vibrios are needed to infect a person who has normal gastric acidity. Most imported foods, even if contaminated with *V. cholerae* O1 at the point of origin, pose minimal risk to the consumer. Bivalve molluscan shellfish eaten raw are the food most likely to carry *V. cholerae* O1 and infect consumers. In 1988, raw oysters shipped from the U.S. coast on the Gulf of Mexico caused single cases of cholera in six states (*2*). The U.S. Food and Drug Administration's (FDA) National Shellfish Sanitation Program does not sanction any imports of bivalve molluscan shellfish from Peru, Ecuador, and Colombia.

Cholera may spread to additional countries in South America, and a small number of U.S. residents may acquire the disease during travel or by eating imported food. Treatment of cholera is simple and highly effective, with case-fatality rates of <1% when proper oral and/or intravenous rehydration therapy is given. Sanitation in the

**FIGURE 1. Countries affected by cholera outbreak – South America, 1991**



*Cholera — Continued*

United States is adequate to make the risk of continued transmission extremely small; none of the cholera cases imported into the United States since 1961 have resulted in secondary transmission (*3*). Sporadic cases of cholera that have occurred in the United States since 1973 have been associated with consumption of seafood from the Gulf coast; only one outbreak of cholera (on a floating oil rig) has been traced to fecal contamination (*4*).

In response to the situation in Peru, in mid-February, FDA substantially increased its surveillance of food imports to safeguard consumers in the United States by increasing sampling and testing of crustaceans, finfish, and produce from Peru for *V. cholerae* O1.

The risk of cholera to tourists is extremely low (*3*), and cholera vaccine is not recommended for persons traveling to affected countries. Careful selection of safe foods and beverages is paramount (*5*).

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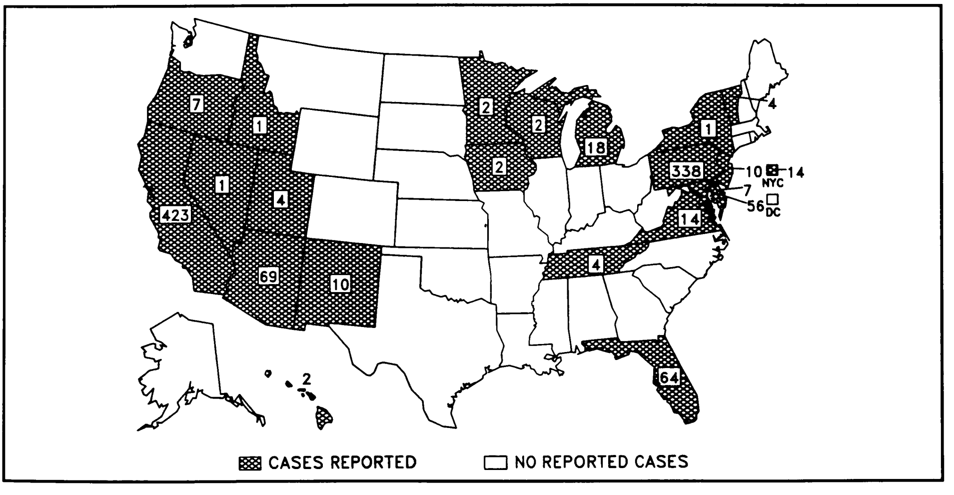
**Reported cases of measles, by state — United States, weeks 10–13, 1991**



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The data in this report are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday. Accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials, as well as matters pertaining to editorial or other textual considerations should be addressed to: Editor, *Morbidity and Mortality Weekly Report*, Mailstop C-08, Centers forDisease Control, Atlanta, Georgia 30333; telephone (404) 332-4555.

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