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Effectiveness in Disease and Injury Prevention

Use of Folic Acid for Prevention of Spina Bifida and Other Neural Tube Defects – 1983–1991

Neural tube defects—including spina bifida, anencephaly, and encephalocele—are common, serious birth defects that are important causes of infant mortality and disability (*1*). Women in the United States who have had a pregnancy resulting in an infant or fetus with a neural tube defect have a 2%–3% risk for having another pregnancy resulting in an infant or fetus with a neural tube defect (i.e., a recurrence) (*2*). The British Medical Research Council (MRC) Vitamin Study Group recently reported the results of a randomized prevention trial that indicated that daily oral supplementation with folic acid before conception and during early pregnancy substantially reduces the recurrence of neural tube defects (*3*). This report summarizes the findings of that study and provides recommendations for supplementation with folic acid to prevent the recurrence of neural tube defects.

The study, which began in July 1983 and was halted in April 1991, involved 33 centers (17 in the United Kingdom and 16 in six other countries). Study participants were women who had had a previous pregnancy that resulted in an infant or fetus with a neural tube defect and who were planning a subsequent pregnancy. Each participant was randomly assigned to one of four supplementation groups (groups A, B, C, and D). Group A received 4 mg of folic acid (the only dose of folic acid studied); group B, a multivitamin preparation* plus 4 mg of folic acid; group C, neither the multivitamin preparation nor folic acid; and group D, the multivitamin preparation without folic acid. All capsules (including those for group C) contained two mineral supplements—ferrous sulfate (120 mg) and di-calcium phosphate (240 mg). Compliance was assessed by counting capsules and by measuring folic acid levels before and after starting supplementation. To test the effect of folic acid supplementation, the MRC study group compared the outcomes of groups A and B with those in groups C and D. To test the effect of the multivitamin preparation, the MRC study group compared the outcomes in groups B and D with those in groups A and C.

*The multivitamin preparation contained vitamin A, 4000 U; vitamin D, 400 U; vitamin B_1, 1.5 mg; vitamin B_2, 1.5 mg; vitamin B_6, 1.0 mg; vitamin C, 40 mg; and nicotinamide, 15 mg.

Neural Tube Defects — Continued

During the study period, complete information was available on 1195 pregnancy outcomes. Neural tube defects recurred in six (1.0%) of 593 infants or fetuses of women who received folic acid (groups A [two of 298] and B [four of 295]), compared with 21 (3.5%) of 602 women who did not receive folic acid (groups C [13 of 300] and D [eight of 302]) (relative risk = 0.29; 95% confidence interval = 0.12–0.71). Thus, folic acid supplementation was associated with a 71% reduction in the recurrence of neural tube defects.

Use of multivitamins without folic acid was not associated with a protective effect. Neural tube defects recurred in 12 (2.0%) of 597 infants or fetuses of women who received multivitamins (groups B and D) compared with 15 (2.5%) of 598 women who did not receive multivitamins (groups A and C) (difference not statistically significant).

The six women whose pregnancies resulted in infants or fetuses with neural tube defects had serum folic acid levels similar to those of all women who received folic acid supplements.

Although adverse effects of folic acid were not detected, limitations in the size of the study groups could have precluded detection of a low frequency effect. However, because of the substantial protective effect, the study data monitoring group recommended halting the study early, so that all women at risk could receive the potential benefits of supplementation.

Adapted from: Lancet *1991;338:131–7, 153–4. Reported by: Birth Defects and Genetic Diseases Br, Div of Birth Defects and Developmental Disabilities, National Center for Environmental Health and Injury Control, CDC.*

Editorial Note: Neural tube defects are common serious birth defects in the United States, and worldwide they contribute substantially to infant mortality and disability. Spina bifida is an inclusive name for various conditions associated with lack of closure of the spine, which, in turn, often causes permanent damage to the spinal cord and spinal nerves (*4*). Such damage results in varying degrees of paralysis and may result in loss of bowel and bladder control. Complications such as severe hydrocephalus may lead to cognitive impairment. Anencephaly is a lethal malformation characterized by the absence of the cranial vault and cerebral hemispheres often resulting in only a small mass of brain tissue attached to the base of the skull (*4*). Encephalocele is a defect in the skull that results in herniation of the meninges and brain tissue (*4*).

Each year, approximately 4000 infants with neural tube defects are born in the United States; worldwide, nearly 400,000 are born with these conditions. The estimated annual medical and surgical costs in the United States (based on 1985 dollars) for all persons with spina bifida exceed $200 million (*5*).

In the study population reported here, daily supplementation with 4 mg of folic acid starting before conception and continuing through the first 3 months of pregnancy prevented 71% of the recurrences of neural tube defects—a 3.5-fold protective effect. This study provides a scientific basis for prevention of a substantial proportion of the recurrences of neural tube defects. However, supplementation with folic acid did not prevent all the recurrences of neural tube defects—possibly because these disorders may be heterogenous in etiology (*6–8*).

Based on these and other findings (*9–12*), CDC recommends the use of folic acid supplementation (4 mg per day) for women who previously have had an infant or fetus with spina bifida, anencephaly, or encephalocele (see box). The only dose of folic acid evaluated by the MRC study was 4 mg per day. However, in an earlier and

Neural Tube Defects — Continued

less definitive nonrandomized study, 0.36 mg per day was associated with a substantial reduction in the recurrence of neural tube defects (*9*). Therefore, use of 4 mg per day should be considered as an interim recommendation, pending further research. Four milligrams of folic acid daily is a high dose—10 times the recommended dietary allowance (RDA) (i.e., 400 μg) for pregnant women in the United States, and more than 20 times the RDA for nonpregnant women (i.e., 180 μg) (*13*). The Food and Drug Administration (FDA) regards the marketing of folic acid at this dosage to require an approved new drug application (NDA). No NDA has been approved by FDA for folic acid for prevention of neural tube defects. Finally, physicians should be aware that folic acid at this dosage (i.e., 4 mg daily) may complicate the diagnosis of vitamin B_{12} deficiency because the dosage may mask the megaloblastic anemia while neurologic manifestations progress.

Interim CDC Recommendations for Folic Acid Supplementation for Women who have had an Infant or Fetus with Spina Bifida, Anencephaly, or Encephalocele — August 1991

1. Women who have had a pregnancy resulting in an infant or fetus with a neural tube defect should be counseled about the increased risk in subsequent pregnancies and should be advised that folic acid supplementation may substantially reduce the risk for neural tube defects in subsequent pregnancies.
2. Women who have had a pregnancy resulting in an infant or fetus with a neural tube defect should be advised to consult their physician as soon as they plan a pregnancy. Unless contraindicated, they should be advised to take 4 mg per day of folic acid starting at the time they plan to become pregnant. Women should take the supplement from at least 4 weeks before conception through the first 3 months of pregnancy.
3. The 4 mg daily dose should be taken only under a physician's supervision. Tablets containing 1 mg folic acid are available as a prescription item. The folic acid dose should be obtained from pills containing only folic acid. Multivitamin (over-the-counter and prescription) preparations containing folic acid should *not* be used to attain the 4 mg dose because harmful levels of vitamins A and D could also be taken. Prescribing physicians should be aware of the potential for high doses of folic acid to complicate the diagnosis of vitamin B_{12} deficiency. Anemia resulting from vitamin B_{12} deficiency may be prevented with high doses of folic acid; however, the neurologic damage that can result from vitamin B_{12} deficiency could continue.
4. These recommendations are provided only for women who previously have given birth to an infant or had a fetus with a neural tube defect; they are *not* intended for 1) women who have never given birth to an infant or had a fetus with a neural tube defect, 2) relatives of women who have had an infant or fetus with a neural tube defect, 3) women who themselves have spina bifida, or 4) women who take the anticonvulsant valproic acid—a known cause of spina bifida.

Neural Tube Defects — Continued

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Epidemiologic Notes and Reports

Cholera — New York, 1991

Through June 26, 1991, cholera has been reported from seven countries in the Western Hemisphere: Brazil, Chile, Colombia, Ecuador, Mexico, Peru, and the United States. In the United States, a total of 14 confirmed cases of epidemic-associated cholera have been reported among persons in Florida (one) (*1*), Georgia (one) (*2*), New Jersey (eight) (*1*), and New York (four). This report summarizes information regarding the four cases reported in New York and describes a new laboratory procedure used to confirm the vehicle of transmission in this outbreak.

On April 26, 1991, a 57-year-old man (patient B) was hospitalized in New York City with a 2-day history of diarrhea; stool culture yielded *Vibrio cholerae* O1. An investigation by the New York City Department of Health identified additional cases among his family and friends. The first person to become ill was a man (patient A) who had returned from Ecuador on April 21 and had onset of watery diarrhea April 22. Although he sought care from a physician, he was not hospitalized, and a stool culture was not obtained.

On April 24, three other persons (patients B, C, and D) had onset of diarrhea. All patients had laboratory evidence of infection with *V. cholerae* O1. A stool culture from patient C, a woman, yielded *V. cholerae* O1. Convalescent phase blood samples from patient D, a woman, and patient A had vibriocidal antibody titers $\geq$1:640,

Cholera – Continued

indicating recent *V. cholerae* O1 infection. The New York City Department of Health Laboratory and CDC identified the isolates as toxigenic *V. cholerae* O1, biotype El Tor, serotype Inaba – the serotype that is causing epidemic cholera in South America.

Patients B, C, and D had not recently visited South America. However, on the evening of April 22 they had eaten a salad containing crab meat from crabs that had been brought from Ecuador by patient A. The crabs had been purchased by patient A at a pier in Guayaquil, Ecuador, on April 20, then boiled and shelled; meat and claws were then stored in a plastic bag in a freezer. On April 21, when patient A returned to New York, he carried the bag in his suitcase; on arrival, the meat and claws were still frosted and were placed in a freezer overnight. On April 22, the crab meat was thawed in a double-boiler for 15–20 minutes. Two hours later, without further cooking, the crab was served in a crab salad and as cold crab in the shell. The crab was consumed during a 6-hour period by patients B, C, and D and by four persons who remained well. Patient A had onset of diarrhea before eating the crab meat but ate after patients B, C, and D had eaten; he did not assist in preparing the food.

Four samples of crab were obtained for culture, including a claw, two pieces of meat that had remained in the plastic bag, and juice saved when the crab meat was thawed for the crab salad. Standard culture procedures were negative for *V. cholerae* O1 at the New York City Department of Health and CDC. However, use of the polymerase chain reaction (PCR) technique with primers recently constructed at CDC enabled dection of the *V. cholerae* O1 toxin gene in one of the pieces of crab meat from the plastic bag.

Reported by: R Roman, MPH, M Middleton, S Cato, E Bell, KR Ong, MD, Commission on Disease Intervention; R Gruenewald, PhD, A Ferguson, MS, A Ramon, MD, Bur of Laboratories, New York City Dept of Health. Enteric Diseases Br, Div of Bacterial and Mycotic Diseases, National Center for Infectious Diseases, CDC.

Editorial Note: Epidemic cholera had not been reported in South America during the 1900s until January 1991, when cholera was reported from several locations in Peru (*3*). As of July 24, 1991, 257,399 probable cholera cases and 2697 cholera-associated deaths have been reported to the Pan American Health Organization from seven countries (Table 1). The cases in New York bring to 14 the total number of confirmed cholera cases in the United States associated with the epidemic in South America; in addition, these cases are the second episode of transmission of *V. cholerae* O1 associated with crabs brought back by a traveler from South America (*1*). The Food and Drug Administration monitors seafood imported into the United States; no cases

TABLE 1. Cholera – Western Hemisphere, 1991

Country	No. cases*	No. hospitalized	No. deaths	Date of report
Peru	223,564	86,954	2,163	June 22
Ecuador	30,535	22,623	501	July 6
Colombia	3,196	1,970	31	June 22
Chile	41	NR†	2	June 22
Mexico	27	7	0	July 3
Brazil	22	8	0	July 15
United States	14	7	0	June 19
Total	**257,399**	**111,569**	**2,697**	

*Probable and confirmed cases.
†Not reported.

Cholera — Continued

of cholera in the continental United States have been linked to commercially imported food products.

Patient A probably became infected with *V. cholerae* O1 while in Ecuador because he had onset of illness within 24 hours of returning to New York. Patients B, C, and D were probably infected by eating the crab. Patient A was unlikely to have contaminated the crab because his illness began after the crab had been cooked, frozen, and packaged, and he touched the crab meat again only after the others had eaten. Secondary spread from patient A is unlikely because person-to-person spread of cholera is infrequent—especially in settings where adequate access to water for washing and sanitation facilities exist. Since 1961, more than 100 domestically acquired and imported cases of cholera have been reported to CDC; none of these cases has been associated with person-to-person spread (CDC, unpublished data).

Crabs are a likely vehicle for transmission of cholera and may be contaminated with *V. cholerae* O1 before or after harvest. Vibrios can survive in crabs boiled for up to 8 minutes (*4*), and undercooked crabs have caused several previous outbreaks (*2,4*). *V. cholerae* O1 biotype El Tor strains multiply rapidly at room temperature in cooked shellfish (*5*). In this report, vibrios that survived boiling in Ecuador or that contaminated the meat during shelling may have multiplied during transport or while the crab salad was held at ambient temperature.

Standard culture procedures can detect only viable organisms; in contrast, PCR can detect DNA from nonviable organisms. Because of the freezing and thawing, *V. cholerae* O1 organisms in the crab may not have been viable. However, PCR analysis indicated that the crabs from the outbreak had been contaminated with toxigenic *V. cholerae* O1. The PCR procedure and other new laboratory tests are potentially important tools for investigating outbreaks of cholera.

The cholera outbreaks in New Jersey (*1*) and New York prompted an ongoing educational campaign to discourage travelers from returning from infected areas (including Peru, Ecuador, and Colombia) with perishable seafood and other high-risk food items. This campaign includes publication by CDC of a travel advisory in English and Spanish and the distribution of letters to airline passengers traveling to and returning from these countries. Newspapers and radio and television stations in the New Jersey/New York area have also helped publicize this message. No additional cases of cholera associated with food brought back from South America have been reported.

A CDC "travelers' hot line" is available in English and Spanish for persons planning travel to Central and South America: the telephone numbers are (404) 332-4559 (English) and (404) 330-3132 (Spanish).

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Current Trends

Imported Dengue — United States, 1990

In 1990, 102 cases of suspected imported dengue (*1*) were reported to CDC from 24 states and the District of Columbia (Table 1). Of these, 24 (22%) cases (from 14 states and the District of Columbia) were serologically or virologically confirmed as dengue. The dengue serotype was identified by virus isolation in two of these cases. Fifty-five of the suspected cases were serologically negative for dengue, and the laboratory diagnosis of 23 remained undetermined because convalescent serum samples were not submitted.

Travel histories were available for 22 of the 24 persons with confirmed dengue. Eight cases were acquired in Oceania, six in the Caribbean, six in Asia, and one each in Mexico and Peru.

Of the 23 persons with laboratory-confirmed dengue for whom gender was reported, 13 were female. Age was reported for 18 persons with confirmed dengue

TABLE 1. Suspected and confirmed cases of imported dengue, by reporting area — United States, 1990

Area	Cases		Travel history of persons with confirmed dengue (serotype, if known)
	Reported	(Confirmed)	
Alabama	2	(0)	
California	8	(3)	1—Tahiti, Fiji, New Zealand; 2—Tahiti, New Zealand, Australia (DEN-3)
Colorado	6	(1)	Southeast Asia
District of Columbia	2	(2)	1—Trinidad; 1—India
Florida	10	(0)	
Georgia	4	(0)	
Hawaii	8	(5)	2—Fiji; 1—New Zealand, Fiji, Australia; 1—Philippines; 1—Thailand
Idaho	1	(0)	
Illinois	3	(1)	Japan, Hong Kong, Thailand (DEN-1)
Maine	1	(0)	
Maryland	2	(1)	Haiti
Massachusetts	5	(1)	Virgin Islands
Michigan	5	(1)	Unknown
Minnesota	3	(1)	Tahiti
Missouri	1	(1)	Puerto Rico
New Jersey	2	(0)	
New York	16	(2)	1—Thailand, Laos, Hong Kong; 1—Puerto Rico
North Carolina	3	(1)	Peru
Ohio	4	(0)	
Pennsylvania	4	(0)	
Tennessee	1	(1)	Mexico
Vermont	1	(0)	
Virginia	3	(2)	1—Puerto Rico; 1—Unknown
Washington	4	(1)	New Guinea
Wisconsin	3	(0)	
Total	**102**	**(24)**	

Dengue — Continued

and ranged from 20 to 70 years (mean: 37 years). The most commonly reported symptoms for confirmed cases were consistent with classic dengue fever (e.g., fever, rash, headache, and myalgia).

Reported by: State and territorial health depts. Dengue Br, Div of Vector-Borne Infectious Diseases, National Center for Infectious Diseases, CDC.

Editorial Note: Dengue is an acute viral disease caused by any of four virus serotypes (DEN 1–4) and is characterized by sudden onset of fever, headache, myalgia, rash, nausea, and vomiting. Although most infections result in relatively mild illness, some may cause the severe forms of the disease, dengue hemorrhagic fever ([DHF] characterized by petechiae, purpura, mild gum bleeding, nosebleeds, menorrhagia, or gastrointestinal bleeding) and dengue shock syndrome.

In the Americas, dengue is transmitted by the *Aedes aegypti* mosquito. Although nearly eradicated in the 1960s, this species is now found in all tropical countries of the region except Bermuda. Dengue is endemic in Puerto Rico and many other islands in the Caribbean, Mexico, and several countries in Central and South America. The most recent major epidemic in the Americas, which involved more than 76,000 cases, occurred in Peru in 1990, with DEN-1 and DEN-4 as the infecting serotypes (*2*). The most recent large outbreak of DHF occurred in Venezuela in 1989–1990 and involved more than 3108 cases of severe dengue and 73 deaths (*3*).

Three of the four serotypes (DEN-1, DEN-2, and DEN-4) have been circulating in the Americas since 1981. Although endemic transmission of DEN-3 has not occurred in the region since 1977, it could be reintroduced into the Americas; in 1989, DEN-3 was isolated from a Florida resident who had returned from Africa and, in January 1990, from a California resident who had returned from Oceania.

Physicians should consider dengue in the differential diagnosis for all patients who present with the above symptoms and a history of travel to tropical areas. When dengue is suspected, the patient's hematocrit and platelet count should be monitored for evidence of hemoconcentration and thrombocytopenia. Acetaminophen products are recommended for management of fever to avoid the anticoagulant properties of acetylsalicylic acid (aspirin). Acute and convalescent-phase serum samples should be obtained for viral isolation and serodiagnosis.

Suspected dengue cases should be reported to state health departments along with a clinical summary, dates of onset of illness and blood collection and epidemiologic information, including a detailed travel history with dates and location of travel. Serum samples should be sent for confirmation through the state health department laboratory to CDC's Dengue Branch, Division of Vector-Borne Infectious Diseases, National Center for Infectious Diseases, P.O. Box 364532, San Juan, Puerto Rico 00936-4532; telephone (809) 749-4400; FAX (809) 749-4450.

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Maternal Mortality Surveillance – Puerto Rico, 1989

Maternal mortality is substantially underreported in the United States and throughout the world (*1,2*). In Puerto Rico, the 1989 revised death certificate contained a new item that asked whether a decedent had been pregnant within the past year. This information enabled a panel of experts to identify and review all death certificates for females aged 10–49 years who had been pregnant within 1 year before death. This report describes how the new item on the birth certificate can be used to improve maternal mortality surveillance in Puerto Rico.

To classify and determine cause of death, the expert panel used the National Pregnancy Mortality Surveillance (*3*) classification of cause of death, developed by CDC in collaboration with the American College of Obstetricians and Gynecologists. A pregnancy-*associated* death was defined as a death from any cause during pregnancy or within 1 calendar year of termination of pregnancy, regardless of the duration or anatomical site of the pregnancy. A pregnancy-*related* death, a subset of pregnancy-associated deaths, was defined as a death resulting from: 1) complications of the pregnancy itself; 2) the chain of events initiated by the pregnancy that led to death; or 3) aggravation of an unrelated condition by the physiologic or pharmacologic effects of the pregnancy that subsequently caused death during pregnancy or within 1 calendar year of termination of pregnancy, regardless of the duration or anatomical site of the pregnancy.

For the 18 decedents whose pregnancies terminated in live births (Table 1), the panel used additional information from birth certificates that had been linked to the mother's death certificates. Of the 14 pregnancy-*related* deaths terminating in live births, five (36%) deaths were attributed to infection; two (14%) each to hemorrhage, pulmonary embolism, eclampsia, and other causes; and one (7%) to complications of anesthesia (Table 1). Birth certificates could not be matched to eight pregnancy-*related* deaths; complications of pregnancy-induced hypertension accounted for six (75%) of these deaths.

Based on the review, the number of deaths classified as pregnancy-*related* in 1989 increased 69% (from the 13 deaths that would have been reported by vital statistics to 22 deaths identified from the new death certificate item). This item identified 46 of the 47 pregnancy-*associated* deaths in Puerto Rico for 1989.

Reported by: A Comas, MD, Dept of Obstetrics and Gynecology, Univ of Puerto Rico School of Medicine; A Navarro, MD, Univ of Puerto Rico Graduate School of Public Health; A Carrera, MD, R Castellanos, MD, N Perez, MS, J Saliceti, PhD, R Reyes, PhD, L Diaz, MS, C Ayoroa, MS, Puerto Rico Dept of Health. Pregnancy and Infant Health Br, Div of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

Editorial Note: A previous study in Puerto Rico based on reviews of death certificates and medical records indicated that, for 1978–1979, 17 (27%) of 62 pregnancy-related deaths were identified by the usual registration of vital events (*4*). Of the 45 additional pregnancy-related deaths identified in that study, 13 (21%) could have been ascertained by review of death certificates that were selected on the basis of suspected misclassification of pregnancy-related causes of death (*4*).

The findings in this report suggest that modification of the death certificate can substantially enhance reporting of pregnancy-related deaths. In Puerto Rico, in 34 of the 47 cases, the new item provided the only basis for determining that a death

Maternal Mortality — Continued

TABLE 1. Maternal mortality, by cause of death, associated condition, and outcome of pregnancy — Puerto Rico, 1989

Cause of death/ Associated condition	Pregnancy outcome*								
	Live birth			Other†			Total		
	R	N	U	R	N	U	R	N	U
Hemorrhage									
Uterine atony	1	0	0	0	0	0	1	0	0
Disseminated intravascular coagulation	1	0	0	0	0	0	1	0	0
Infection									
Chorioamnionitis	1	0	0	0	0	0	1	0	0
Septicemia	3	0	0	1	0	2	4	0	2
Pneumonia	1	0	0	0	0	0	1	0	0
Embolism									
Amniotic fluid	1	0	0	0	0	0	1	0	0
Unknown	1	1	0	0	0	0	1	1	0
Pregnancy-induced hypertension complications									
Preeclampsia									
Cerebrovascular hemorrhage	0	0	0	1	0	0	1	0	0
Metabolic complications	0	0	0	1	0	0	1	0	0
Eclampsia									
Cerebrovascular hemorrhage	0	0	0	1	0	0	1	0	0
Cerebral edema	0	0	0	1	0	0	1	0	0
Unknown	2	0	0	1	0	0	3	0	0
Other/unspecified	0	0	0	1	0	0	1	0	0
Anesthesia complications	1	0	0	0	0	0	1	0	0
Other causes									
AIDS	0	0	0	0	7	0	0	7	0
Injury	0	0	0	0	2	0	0	2	0
Cancer	1	2	0	0	0	1	1	2	1
Pulmonary problems	0	0	0	0	0	8	0	0	8
Neurovascular problems	0	1	0	0	0	0	0	1	0
Cardiovascular problems	0	0	0	1	0	0	1	0	0
Multiple organ failure	1	0	0	0	0	0	1	0	0
Unknown	0	0	0	0	0	1	0	0	1
Total	**14**	**4**	**0**	**8**	**9**	**12**	**22**	**13**	**12**

**Pregnancy-related (R):* death of a woman resulting from either 1) complications of the pregnancy itself, 2) the chain of events initiated by the pregnancy that led to death, or 3) aggravation of an unrelated condition by the physiologic or pharmacologic effects of the pregnancy that subsequently caused death during pregnancy or within 1 calendar year of termination of pregnancy, regardless of the duration or anatomical site of pregnancy. *Pregnancy-associated, but not pregnancy-related (N):* death of a woman from any cause during pregnancy or within 1 calendar year of termination of pregnancy, regardless of the duration or anatomical site of pregnancy but not related to pregnancy. *Pregnancy-associated, but unknown relation to pregnancy (U):* death of a woman from any cause, during pregnancy or within 1 calendar year of termination of pregnancy, regardless of the duration or anatomical site of pregnancy, and for which the expert panel could not ascertain with the available information whether it was related to pregnancy.

†Other outcomes of pregnancy include undelivered, stillbirth, abortion, or ectopic or molar pregnancy.

Maternal Mortality — Continued

occurred during pregnancy or within 1 year of termination of pregnancy; however, the sensitivity and specificity of this approach was not assessed.

The national health objectives for the year 2000 have specified as a target a maternal mortality ratio (MMR) of 3.3 per 100,000 live births (*5*). Accurate documentation of the magnitude of pregnancy-related mortality is important for formulating prevention measures and other interventions. Based on a total of 66,692 live births in Puerto Rico for 1989, the actual MMR probably ranged from 33 to 51 per 100,000 live births, consistent with estimates for 1978–1979 (42 per 100,000 live births) (*4*) and 1982 (40 per 100,000) (*6*).

As a result of this assessment, the Puerto Rico Department of Health is establishing active surveillance of pregnancy-related deaths in Puerto Rico. In addition, hospital medical records of the 47 deaths identified as pregnancy-*associated* are being reviewed to assess the sensitivity and specificity of the initial process involving the expert panel review. Finally, death certificates of females aged 10–49 years will be matched with birth and fetal death certificates to assess the sensitivity and specificity of the new death certificate item in identifying pregnancy-associated deaths among mothers whose pregnancies terminated in a live birth or fetal death.

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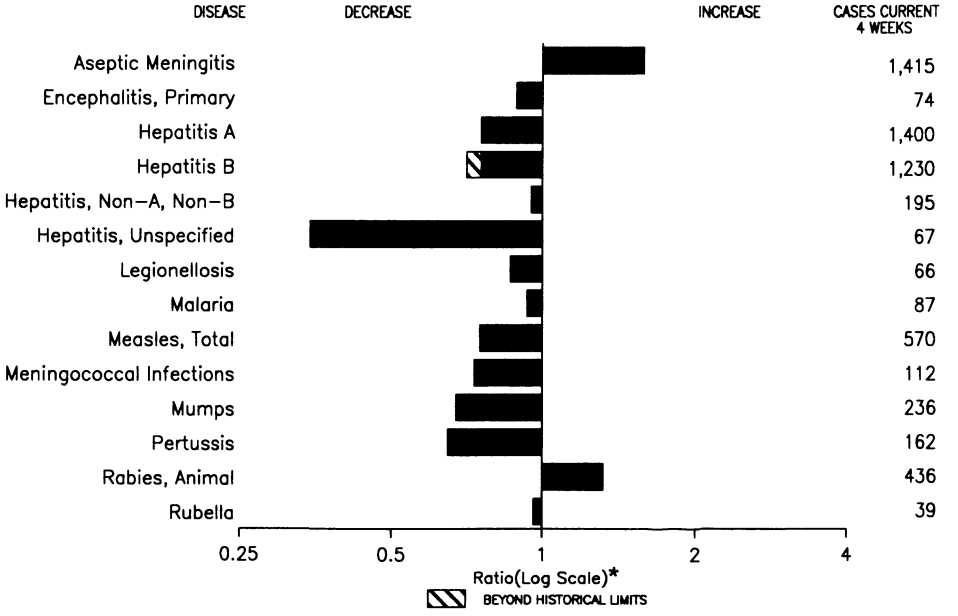
Notice to Readers

Addition of Facsimile Capability to Malaria Hotline of CDC Voice Information Service

The CDC Voice Information Service ([404] 332-4555) has added facsimile capability to the malaria hotline. By following the instructions, callers can receive on their fax machines information on the risk for malaria and on malaria prevention measures in Africa, Southeast Asia, South America, Central America and the Caribbean, Mexico, the Indian Subcontinent, and Oceania; special information for children and pregnant women; and a world map indicating areas with malaria transmission. This service is available 24 hours a day.

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending July 27, 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 July 27, 1991 (30th Week)

	Cum. 1991		Cum. 1991
AIDS	25,087	Measles: imported	125
Anthrax	-	indigenous	7,360
Botulism: Foodborne	11	Plague	-
Infant	36	Poliomyelitis, Paralytic*	-
Other	4	Psittacosis	56
Brucellosis	36	Rabies, human	-
Cholera	14	Syphilis, primary & secondary	23,777
Congenital rubella syndrome	11	Syphilis, congenital, age < 1 year	12
Diphtheria	1	Tetanus	19
Encephalitis, post-infectious	50	Toxic shock syndrome	179
Gonorrhea	331,448	Trichinosis	42
Haemophilus influenzae (invasive disease)	1,915	Tuberculosis	12,606
Hansen Disease	82	Tularemia	80
Leptospirosis	34	Typhoid fever	208
Lyme Disease	3,873	Typhus fever, tickborne (RMSF)	276

*Three suspected cases of poliomyelitis have been reported in 1991; none of the 8 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 July 27, 1991, and July 28, 1990 (30th Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea		Hepatitis (Viral), by type				Legionellosis	Lyme Disease
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	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	25,087	4,613	408	50	331,448	386,751	14,040	9,553	1,689	761	635	3,873
NEW ENGLAND	993	301	17	1	8,195	10,527	339	519	51	23	43	718
Maine	32	9	3	-	97	130	15	15	2	-	-	-
N.H.	27	27	2	-	154	124	23	17	5	-	3	21
Vt.	11	127	1	-	30	33	15	5	5	-	2	3
Mass.	589	77	9	1	3,397	4,270	167	369	27	20	35	61
R.I.	38	54	-	-	670	660	61	17	10	3	3	62
Conn.	296	7	2	-	3,847	5,310	58	96	2	-	-	571
MID. ATLANTIC	6,691	534	30	10	38,747	53,173	1,300	834	166	14	182	2,311
Upstate N.Y.	777	260	14	6	7,139	7,611	537	324	101	8	63	1,462
N.Y. City	3,884	113	-	-	13,855	22,930	418	108	5	-	20	-
N.J.	1,334	-	-	-	6,698	8,869	166	209	34	-	20	469
Pa.	696	161	16	4	11,055	13,763	179	193	26	6	79	380
E.N. CENTRAL	1,846	839	115	6	60,703	72,228	1,776	1,112	273	35	126	130
Ohio	357	279	39	2	18,730	21,752	246	258	121	14	61	73
Ind.	182	89	12	1	6,341	6,377	263	152	1	1	13	7
Ill.	855	144	29	3	18,463	22,445	746	153	33	1	11	4
Mich.	337	309	32	-	13,653	16,567	203	350	78	19	31	46
Wis.	115	18	3	-	3,516	5,087	318	199	40	-	10	-
W.N. CENTRAL	659	268	21	7	16,146	19,907	1,434	427	183	14	32	138
Minn.	141	44	13	-	1,618	2,365	222	43	12	2	5	27
Iowa	66	59	-	4	1,147	1,439	35	29	8	3	9	9
Mo.	351	116	6	3	9,958	12,007	385	289	159	6	11	97
N. Dak.	4	2	-	-	30	76	29	4	2	1	1	-
S. Dak.	1	4	2	-	198	130	546	3	-	-	3	-
Nebr.	37	16	-	-	1,104	979	164	22	1	-	3	-
Kans.	59	27	-	-	2,091	2,911	53	37	1	2	-	5
S. ATLANTIC	5,929	1,005	87	18	102,096	110,856	1,004	1,984	240	158	105	254
Del.	47	18	1	-	1,449	1,819	7	31	4	2	2	27
Md.	650	78	15	1	10,538	12,388	177	248	43	13	20	87
D.C.	401	33	1	-	5,623	7,446	52	86	1	1	-	-
Va.	415	153	25	3	9,917	10,280	107	120	22	110	7	60
W. Va.	38	6	5	-	681	717	14	36	1	6	-	17
N.C.	260	122	22	-	20,259	18,015	105	289	85	-	12	38
S.C.	187	28	-	-	7,890	8,902	27	445	16	3	22	3
Ga.	807	153	6	2	24,643	24,548	118	290	30	-	12	12
Fla.	3,124	414	12	12	21,096	26,741	397	439	38	23	30	10
E.S. CENTRAL	595	349	22	-	31,342	31,560	138	803	212	3	35	69
Ky.	92	69	3	-	3,347	3,762	21	104	5	2	13	25
Tenn.	186	93	14	-	11,058	9,731	84	604	191	-	10	34
Ala.	196	159	5	-	8,870	10,265	27	87	12	1	11	10
Miss.	121	28	-	-	8,067	7,802	6	8	4	-	1	-
W.S. CENTRAL	2,491	678	42	1	38,183	41,566	2,025	1,274	65	149	25	44
Ark.	115	44	3	-	4,420	5,077	188	62	1	5	5	12
La.	430	68	9	-	8,857	7,734	84	168	6	5	5	1
Okla.	112	1	3	-	3,869	3,647	173	132	25	10	6	23
Tex.	1,834	565	27	1	21,037	25,108	1,580	912	33	129	9	8
MOUNTAIN	732	97	11	2	7,028	8,029	2,269	604	88	97	44	10
Mont.	20	2	1	-	64	105	60	46	3	5	2	-
Idaho	12	-	-	-	84	80	56	46	1	-	3	-
Wyo.	9	-	-	-	57	110	90	6	-	-	-	8
Colo.	273	33	2	1	1,992	2,060	346	86	34	17	8	-
N. Mex.	60	12	-	-	656	738	594	136	8	27	1	-
Ariz.	149	27	8	1	2,639	3,125	714	109	12	38	16	-
Utah	62	10	-	-	184	242	184	46	11	10	4	-
Nev.	147	13	-	-	1,352	1,569	225	129	19	-	10	2
PACIFIC	5,151	542	63	5	29,008	38,905	3,755	1,996	411	268	43	199
Wash.	350	-	6	1	2,506	3,515	382	281	98	15	1	-
Oreg.	153	-	-	-	1,194	1,481	235	185	74	7	1	-
Calif.	4,522	489	55	4	24,390	32,804	3,036	1,477	222	245	39	199
Alaska	14	21	2	-	458	694	83	25	13	1	-	-
Hawaii	112	32	-	-	460	411	19	28	4	-	2	-
Guam	2	-	-	-	-	173	-	-	-	-	-	-
P.R.	860	163	2	2	366	460	65	288	125	37	-	-
V.I.	13	-	-	-	259	249	1	6	-	-	-	-
Amer. Samoa	-	-	-	-	-	53	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	-	142	-	-	-	-	-	-

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 July 27, 1991, and July 28, 1990 (30th 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	590	67	7,360	2	125	16,909	1,344	41	2,750	49	1,214	1,880	11	1,046	668
NEW ENGLAND	40	2	46	-	10	270	94	-	21	8	198	213	-	4	7
Maine	1	2	2	-	-	29	6	-	-	2	46	6	-	-	-
N.H.	2	-	-	-	-	8	9	-	3	-	17	12	-	1	1
Vt.	1	-	5	-	-	1	11	-	2	-	3	6	-	-	-
Mass.	18	-	19	-	8	21	52	-	1	5	116	175	-	2	2
R.I.	7	-	2	-	-	30	-	-	3	-	-	2	-	-	1
Conn.	11	-	18	-	2	181	16	-	12	1	16	12	-	1	3
MID. ATLANTIC	83	-	3,964	-	6	1,200	137	3	203	1	102	327	-	557	4
Upstate N.Y.	20	-	302	-	4	305	76	3	76	1	71	254	-	536	3
N.Y. City	32	-	1,550	-	-	266	8	-	-	-	-	-	-	-	-
N.J.	24	-	590	-	1	259	26	-	54	-	1	19	-	-	-
Pa.	7	-	1,522	-	1	370	27	-	73	-	30	54	-	21	1
E.N. CENTRAL	53	-	67	-	10	3,366	210	-	258	-	197	492	1	173	30
Ohio	12	-	1	-	2	439	71	-	58	-	74	80	-	147	1
Ind.	3	-	-	-	1	409	15	-	6	-	47	81	-	1	-
Ill.	20	-	25	-	-	1,300	59	-	100	-	35	176	-	4	18
Mich.	16	-	39	-	-	468	46	-	78	-	23	41	1	20	9
Wis.	2	-	2	-	7	750	19	-	16	-	18	114	-	1	2
W.N. CENTRAL	20	-	30	-	5	776	79	2	81	8	81	72	-	16	6
Minn.	6	-	5	-	5	307	16	-	9	7	29	7	-	6	1
Iowa	4	-	15	-	-	24	7	-	15	-	8	8	-	5	4
Mo.	5	-	-	-	-	92	30	1	26	1	29	47	-	5	-
N. Dak.	1	-	-	-	-	-	1	-	2	-	1	1	-	-	1
S. Dak.	-	-	-	-	-	23	2	-	-	-	3	1	-	-	-
Nebr.	-	-	1	-	-	106	6	1	5	-	5	2	-	-	-
Kans.	4	-	9	-	-	224	17	-	24	-	6	6	-	-	-
S. ATLANTIC	118	7	414	-	17	977	247	12	988	21	130	152	1	12	15
Del.	1	-	21	-	-	11	2	-	6	-	-	5	-	-	-
Md.	31	-	167	-	-	204	27	4	190	14	31	37	-	6	2
D.C.	7	-	-	-	-	22	7	-	21	-	-	14	-	1	1
Va.	25	-	24	-	4	70	26	-	43	-	16	14	-	-	1
W. Va.	2	-	-	-	-	6	11	-	16	-	7	10	-	-	-
N.C.	4	3	35	-	3	30	46	5	203	1	19	38	1	2	-
S.C.	7	-	12	-	-	4	25	1	326	-	9	5	-	-	-
Ga.	15	-	10	-	4	107	50	-	31	-	22	13	-	-	-
Fla.	26	4	145	-	6	523	53	2	152	6	26	16	-	3	11
E.S. CENTRAL	10	-	6	-	1	137	93	-	151	1	45	97	-	100	1
Ky.	2	-	1	-	1	30	34	-	-	-	-	-	-	-	-
Tenn.	5	-	5	-	-	60	27	-	125	-	17	42	-	100	1
Ala.	3	-	-	-	-	21	31	-	8	1	28	49	-	-	-
Miss.	-	-	-	-	-	26	1	-	18	-	-	6	-	-	-
W.S. CENTRAL	38	-	115	-	12	3,887	99	4	302	-	33	41	-	5	4
Ark.	4	-	-	-	5	42	15	-	39	-	3	2	-	1	3
La.	8	-	-	-	-	10	22	1	20	-	9	14	-	-	-
Okla.	4	-	-	-	-	170	13	-	12	-	15	25	-	-	1
Tex.	22	-	115	-	7	3,665	49	3	231	-	6	-	-	4	-
MOUNTAIN	23	5	915	2	17	802	56	9	270	4	140	176	1	5	101
Mont.	1	-	-	-	-	1	9	-	-	1	2	26	-	-	13
Idaho	2	4	380	-	2	25	7	-	7	-	20	35	-	2	49
Wyo.	-	1	1	2§	2	15	1	-	3	-	3	-	-	-	-
Colo.	7	-	1	-	4	133	10	8	113	-	66	64	-	-	4
N. Mex.	5	-	117	-	5	90	8	N	N	3	21	9	-	-	-
Ariz.	6	-	274	-	-	272	15	-	122	-	8	28	-	-	30
Utah	1	-	125	-	4	71	-	-	13	-	18	10	-	-	1
Nev.	1	-	17	-	-	195	6	1	12	-	2	4	1	3	4
PACIFIC	205	53	1,803	-	47	5,494	329	11	476	6	288	310	8	174	500
Wash.	18	-	1	-	3	254	40	-	93	-	71	72	-	-	-
Oreg.	5	-	34	-	29	206	41	N	N	1	38	30	-	2	9
Calif.	178	53	1,764	-	11	4,942	240	9	355	5	135	178	8	169	481
Alaska	-	-	-	-	1	80	7	-	9	-	12	4	-	-	-
Hawaii	4	-	4	-	3	12	1	2	19	-	32	26	-	3	10
Guam	-	U	-	U	-	1	-	U	-	U	-	-	U	-	-
P.R.	1	4	87	-	1	914	15	-	8	-	27	5	-	1	-
V.I.	-	-	-	-	-	21	-	1	8	-	-	-	-	-	-
Amer. Samoa	-	U	-	U	-	377	-	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 July 27, 1991, and July 28, 1990 (30th 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	23,777	28,205	179	12,606	12,966	80	208	276	3,443
NEW ENGLAND	643	1,040	9	336	288	1	22	5	28
Maine	-	5	4	27	-	-	1	-	-
N.H.	12	41	1	5	3	-	-	-	1
Vt.	1	1	-	4	7	-	-	-	-
Mass.	302	401	4	167	158	1	20	4	-
R.I.	35	9	-	27	41	-	-	-	-
Conn.	293	583	-	106	79	-	1	1	27
MID. ATLANTIC	3,961	5,862	29	2,919	3,068	-	40	6	1,101
Upstate N.Y.	103	509	13	192	253	-	7	5	388
N.Y. City	1,975	2,627	1	1,811	1,885	-	20	-	-
N.J.	805	963	-	518	523	-	10	1	520
Pa.	1,078	1,763	15	398	407	-	3	-	193
E.N. CENTRAL	2,719	1,904	37	1,264	1,244	3	13	21	73
Ohio	363	294	20	184	213	-	2	12	11
Ind.	76	44	-	107	110	-	-	7	5
Ill.	1,341	730	9	661	617	1	3	2	13
Mich.	668	617	8	256	255	2	7	-	13
Wis.	271	219	-	56	49	-	1	-	31
W.N. CENTRAL	417	267	30	302	330	31	2	20	519
Minn.	45	51	7	59	61	-	2	-	187
Iowa	37	38	6	44	34	-	-	1	100
Mo.	290	135	8	128	158	27	-	12	7
N. Dak.	-	1	-	3	14	-	-	-	64
S. Dak.	1	1	1	24	9	3	-	1	123
Nebr.	9	8	1	11	15	-	-	2	10
Kans.	35	33	7	33	39	1	-	4	28
S. ATLANTIC	7,141	9,005	15	2,384	2,376	4	39	115	844
Del.	91	104	1	16	28	-	-	-	93
Md.	597	690	-	216	191	-	7	15	316
D.C.	448	585	1	117	88	-	2	-	6
Va.	536	515	3	209	203	-	8	6	164
W. Va.	19	7	-	41	41	-	1	3	35
N.C.	1,094	1,046	7	325	308	1	2	54	4
S.C.	890	559	-	234	282	1	-	24	63
Ga.	1,761	2,276	-	482	359	1	4	12	143
Fla.	1,705	3,223	3	744	876	1	15	1	20
E.S. CENTRAL	2,611	2,477	9	860	942	8	2	48	105
Ky.	47	49	4	186	225	2	2	16	26
Tenn.	919	1,030	5	266	235	6	-	22	29
Ala.	934	740	-	222	299	-	-	10	50
Miss.	711	658	-	186	183	-	-	-	-
W.S. CENTRAL	4,385	4,619	6	1,455	1,610	21	9	55	415
Ark.	386	314	3	121	198	14	-	10	23
La.	1,442	1,427	-	128	201	-	2	-	4
Okla.	110	136	3	104	114	7	-	45	123
Tex.	2,447	2,742	-	1,102	1,097	-	7	-	265
MOUNTAIN	334	534	23	343	285	9	5	4	111
Mont.	5	-	-	3	10	7	-	4	20
Idaho	3	6	-	4	8	-	-	-	1
Wyo.	4	1	-	3	4	1	-	-	52
Colo.	53	31	5	33	13	1	1	-	9
N. Mex.	21	29	6	44	52	-	-	-	1
Ariz.	216	389	4	185	142	-	3	-	21
Utah	5	5	8	30	18	-	-	-	3
Nev.	27	73	-	41	38	-	1	-	4
PACIFIC	1,566	2,497	21	2,743	2,823	3	76	2	247
Wash.	95	247	3	173	161	1	4	1	1
Oreg.	45	91	-	63	75	1	3	1	3
Calif.	1,418	2,133	18	2,355	2,456	1	66	-	239
Alaska	4	11	-	35	30	-	-	-	3
Hawaii	4	15	-	117	101	-	3	-	1
Guam	-	2	-	-	23	-	-	-	-
P.R.	275	204	-	109	66	-	9	-	26
V.I.	72	3	-	1	4	-	-	-	-
Amer. Samoa	-	-	-	-	11	-	-	-	-
C.N.M.I.	-	1	-	-	40	-	-	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,* week ending July 27, 1991 (30th Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	666	457	104	74	17	14	55
Boston, Mass.	173	102	28	29	7	7	19
Bridgeport, Conn.	31	24	4	2	1	-	1
Cambridge, Mass.	22	17	2	2	1	-	4
Fall River, Mass.	31	28	2	1	-	-	-
Hartford, Conn.	62	37	11	10	1	3	3
Lowell, Mass.	29	21	3	5	-	-	-
Lynn, Mass.	24	20	4	-	-	-	1
New Bedford, Mass.	34	26	4	4	-	-	1
New Haven, Conn.	47	33	5	4	4	1	4
Providence, R.I.	48	33	7	7	1	-	1
Somerville, Mass.	6	4	1	1	-	-	-
Springfield, Mass.	42	29	8	2	1	2	1
Waterbury, Conn.	41	33	6	2	-	-	5
Worcester, Mass.	76	50	19	5	1	1	15
MID. ATLANTIC	2,876	1,867	563	315	73	56	110
Albany, N.Y.	41	24	14	-	1	2	3
Allentown, Pa.	23	18	4	1	-	-	-
Buffalo, N.Y.	104	66	25	2	8	3	5
Camden, N.J.	28	18	6	3	1	-	-
Elizabeth, N.J.	19	9	5	3	-	2	1
Erie, Pa.†	32	25	5	2	-	-	2
Jersey City, N.J.	52	35	7	4	1	5	1
New York City, N.Y.	1,473	912	289	211	36	25	41
Newark, N.J.	67	31	18	13	3	-	7
Paterson, N.J.	28	21	4	1	1	1	-
Philadelphia, Pa.	501	330	104	40	17	10	30
Pittsburgh, Pa.†	94	65	16	7	2	4	5
Reading, Pa.	45	37	5	3	-	-	5
Rochester, N.Y.	151	108	28	11	2	2	3
Schenectady, N.Y.	23	18	4	1	-	-	-
Scranton, Pa.†	38	29	7	1	-	1	2
Syracuse, N.Y.	85	64	11	8	1	1	2
Trenton, N.J.	26	21	5	-	-	-	-
Utica, N.Y.	19	17	1	1	-	-	1
Yonkers, N.Y.	27	19	5	3	-	-	2
E.N. CENTRAL	2,322	1,414	465	238	137	68	101
Akron, Ohio	84	56	15	5	2	6	-
Canton, Ohio	45	35	7	2	1	-	5
Chicago, Ill.	438	163	109	85	69	12	5
Cincinnati, Ohio	178	124	29	14	5	6	16
Cleveland, Ohio	172	95	41	22	6	8	-
Columbus, Ohio	171	114	33	10	9	5	2
Dayton, Ohio	128	85	27	10	4	2	10
Detroit, Mich.	243	151	44	31	10	7	3
Evansville, Ind.	50	36	8	3	3	-	1
Fort Wayne, Ind.	72	44	17	3	3	5	1
Gary, Ind.	14	9	2	2	1	-	1
Grand Rapids, Mich.	56	43	6	1	2	4	9
Indianapolis, Ind.	178	115	38	16	3	6	11
Madison, Wis.	40	27	7	2	4	-	2
Milwaukee, Wis.	125	93	18	10	3	1	10
Peoria, Ill.	41	23	9	7	-	2	1
Rockford, Ill.	42	32	7	3	-	-	6
South Bend, Ind.	34	20	5	4	5	-	3
Toledo, Ohio	143	95	33	7	4	4	9
Youngstown, Ohio	68	54	10	1	3	-	6
W.N. CENTRAL	781	555	111	61	25	29	45
Des Moines, Iowa	88	62	13	8	3	2	3
Duluth, Minn.	20	17	1	-	-	2	-
Kansas City, Kans.	21	15	4	2	-	-	2
Kansas City, Mo.	101	70	16	7	5	3	5
Lincoln, Nebr.	42	32	7	1	1	1	3
Minneapolis, Minn.	184	141	20	13	7	3	16
Omaha, Nebr.	79	61	10	4	1	3	6
St. Louis, Mo.	123	74	24	12	3	10	6
St. Paul, Minn.	60	41	8	5	2	4	3
Wichita, Kans.	63	42	8	9	3	1	1
S. ATLANTIC	1,209	734	259	133	36	41	55
Atlanta, Ga.	177	97	39	33	4	4	4
Baltimore, Md.	188	102	50	24	5	7	12
Charlotte, N.C.	128	84	23	15	1	5	4
Jacksonville, Fla.	124	83	25	10	4	2	12
Miami, Fla.	98	64	17	12	4	1	-
Norfolk, Va.	70	40	15	2	5	8	4
Richmond, Va.	92	49	24	10	3	2	5
Savannah, Ga.	60	41	12	3	4	-	3
St. Petersburg, Fla.	69	40	14	11	2	2	-
Tampa, Fla.	178	113	37	12	4	10	8
Washington, D.C.§	U	U	U	U	U	U	U
Wilmington, Del.	25	21	3	1	-	-	3
E.S. CENTRAL	748	464	162	70	26	26	45
Birmingham, Ala.	107	57	21	13	9	7	2
Chattanooga, Tenn.	51	34	8	8	1	-	4
Knoxville, Tenn.	101	61	21	11	2	6	8
Louisville, Ky.	72	50	18	2	-	2	6
Memphis, Tenn.	204	122	52	16	8	6	13
Mobile, Ala.	38	24	6	4	3	1	1
Montgomery, Ala.	32	22	5	5	-	-	-
Nashville, Tenn.	143	94	31	11	3	4	11
W.S. CENTRAL	1,399	884	302	134	49	30	79
Austin, Tex.	63	43	13	4	2	1	4
Baton Rouge, La.	61	43	12	4	1	1	3
Corpus Christi, Tex.	52	35	11	4	2	-	2
Dallas, Tex.	223	142	38	27	10	6	6
El Paso, Tex.	60	36	14	6	3	1	5
Ft. Worth, Tex.	103	63	20	15	5	-	3
Houston, Tex.	335	178	94	41	11	11	33
Little Rock, Ark.	71	47	14	6	2	2	3
New Orleans, La.	100	61	20	8	5	6	-
San Antonio, Tex.	168	121	33	8	6	-	7
Shreveport, La.	65	40	17	6	-	2	5
Tulsa, Okla.	98	75	16	5	2	-	8
MOUNTAIN	670	457	123	44	26	19	35
Albuquerque, N.M.	72	42	20	5	3	1	2
Colo. Springs, Colo.	40	23	12	2	1	2	1
Denver, Colo.	102	72	21	7	1	1	14
Las Vegas, Nev.	100	64	25	8	2	1	4
Ogden, Utah	21	16	2	1	-	2	1
Phoenix, Ariz.	163	111	21	16	7	8	4
Pueblo, Colo.	31	23	6	2	-	-	2
Salt Lake City, Utah	40	27	5	3	3	2	6
Tucson, Ariz.	101	79	11	-	9	2	1
PACIFIC	1,405	920	247	148	42	46	101
Berkeley, Calif.	12	8	2	-	-	2	2
Fresno, Calif.	138	92	22	16	5	3	13
Glendale, Calif.§	U	U	U	U	U	U	U
Honolulu, Hawaii	92	67	14	5	4	2	15
Long Beach, Calif.	80	48	13	11	3	5	8
Los Angeles, Calif.§	U	U	U	U	U	U	U
Oakland, Calif.§	U	U	U	U	U	U	U
Pasadena, Calif.	27	18	4	4	1	-	4
Portland, Oreg.	134	102	13	10	5	4	3
Sacramento, Calif.	168	110	37	12	5	4	13
San Diego, Calif.	189	116	33	26	4	9	19
San Francisco, Calif.	158	77	41	26	5	8	4
San Jose, Calif.	149	104	25	15	2	3	10
Seattle, Wash.	127	79	27	13	4	4	3
Spokane, Wash.	51	41	4	4	1	1	3
Tacoma, Wash.	80	58	12	6	3	1	4
TOTAL	12,076††	7,752	2,336	1,217	431	329	626

*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.

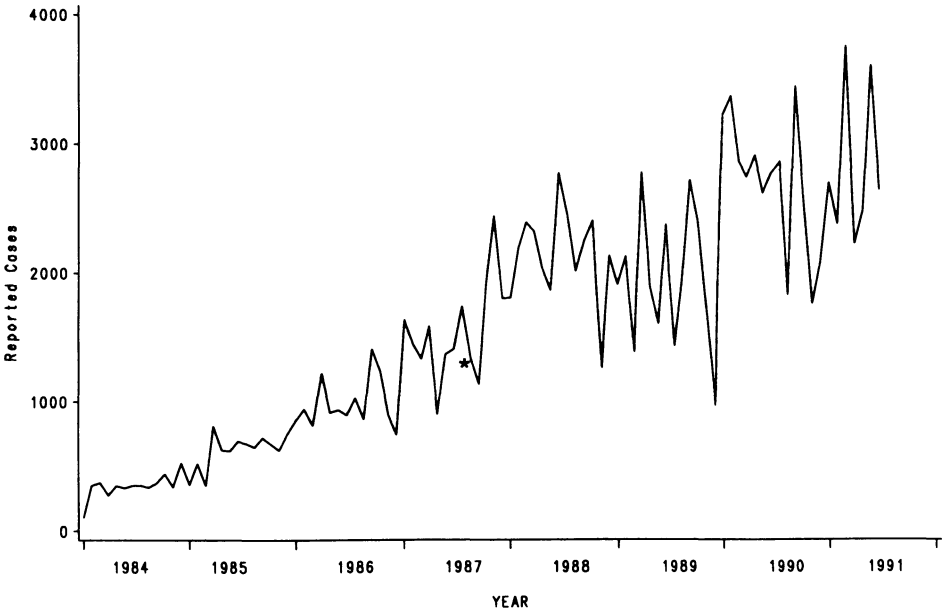
**Pneumonia and influenza.

†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).

FIGURE II. Acquired immunodeficiency syndrome cases, by 4-week period of report — United States, 1984–1991



*Change in case definition.

FIGURE III. Tuberculosis cases, by 4-week period of report — United States, 1984–1991

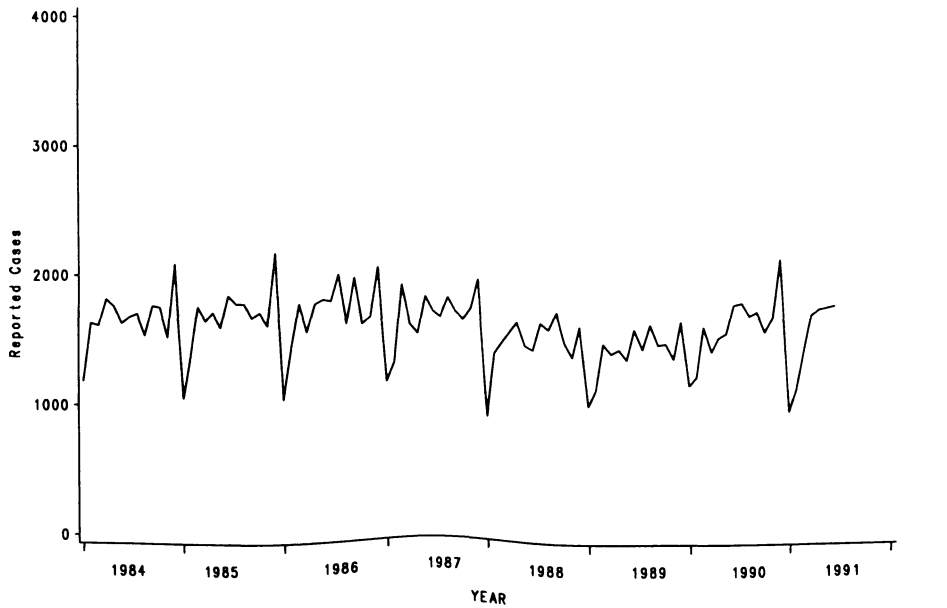


FIGURE IV. Gonorrhea cases, by 4-week period of report — United States, 1984–1991

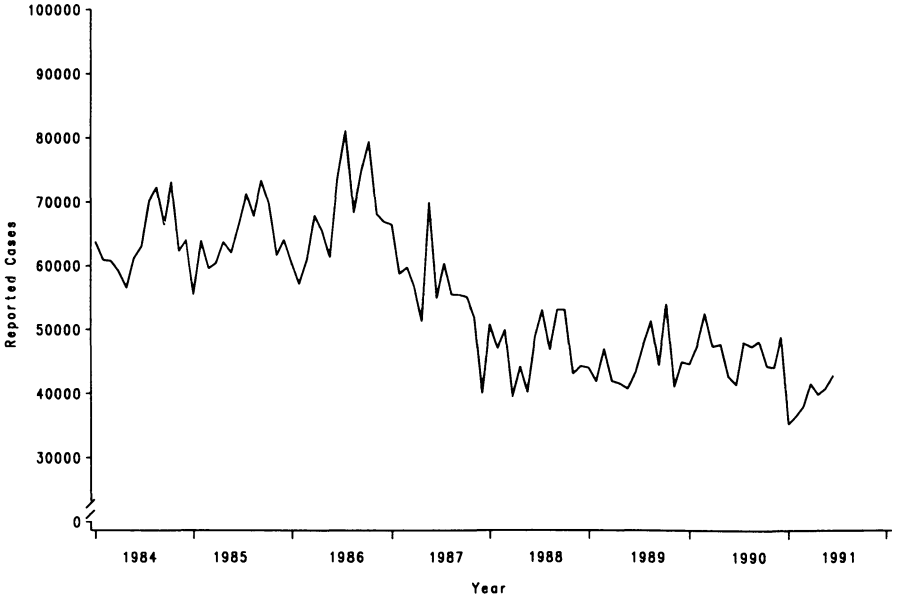
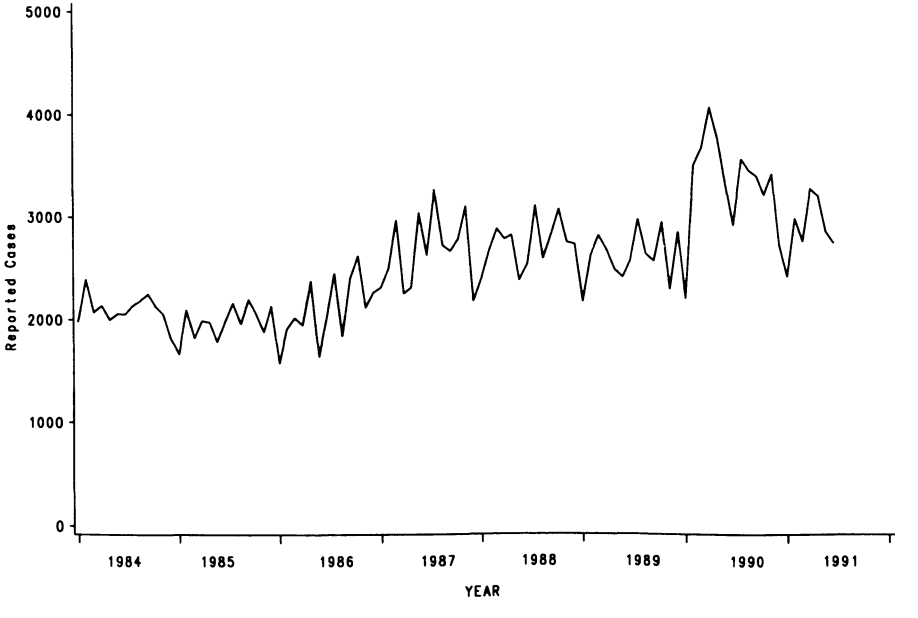


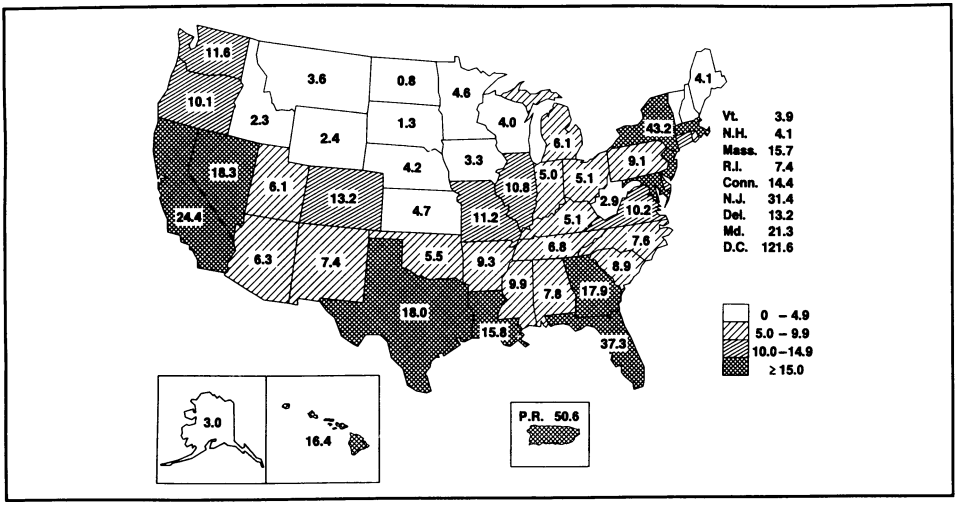
FIGURE V. Syphilis cases, by 4-week period of report — United States, 1984–1991



Quarterly AIDS Map

The following map provides information on the reported number of acquired immunodeficiency syndrome (AIDS) cases per 100,000 population by state of residence for July 1990 through June 1991. The map appears quarterly in *MMWR*. More detailed information on AIDS cases is provided in the monthly *HIV/AIDS Surveillance Report*, single copies of which are available free from the National AIDS Clearinghouse, P.O. Box 6003, Rockville, MD 20850; telephone (800) 458-5231.

AIDS cases per 100,000 population — United States, July 1990–June 1991



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Director, Centers for Disease Control
William L. Roper, M.D., M.P.H.
Director, Epidemiology Program Office
Stephen B. Thacker, M.D., M.Sc.

Editor, *MMWR* Series
Richard A. Goodman, M.D., M.P.H.
Managing Editor, *MMWR* (Weekly)
Karen L. Foster, M.A.

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