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Current Trends

Varicella-Zoster Immune Globulin Distribution — United States and Other Countries, 1981-1983

Since its licensure on February 1, 1981, varicella-zoster immune globulin (VZIG) has been produced and distributed in Massachusetts by the Massachusetts Public Health Biologic Laboratories (MPHBL) and distributed elsewhere by the American Red Cross Services—Northeast Region through regional blood centers (see pages 97-99). Before licensure, VZIG was distributed as an investigational new drug (IND), first by CDC and later by CDC and the Sidney Farber Cancer Institute. Between February 1, 1981, and September 30, 1983, 27,641 vials of VZIG were distributed in the United States (24,190 vials), Canada (1,987), and 15 other countries (1,464). This represents between 9,000 and 10,000 exposures to varicella-zoster (V-Z) virus. During the IND period of January 1, 1978, to November 30, 1980, 5,735 vials (for 2,263 exposures) were distributed using strict eligibility criteria (*1*) (Table 1). (Data for December 1980 and January 1981 are unavailable.) Distribution increased threefold during the first year after licensure, followed by a 67% increase in 1982. Data available through September 1983 suggest that the observed rate of increase in distribution between 1980 and 1982 has diminished substantially.

Seasonal distribution patterns of VZIG distribution and reported varicella occurrence are similar, with the peak period of distribution (February-May) coinciding with the expected varicella seasonal peak incidence (*2*) (Figure 1). Based on annual averages, between three (January) and 11 (August and September) times as much VZIG was distributed as a licensed product than as an IND.

TABLE 1. Number of varicella-zoster immune globulin vials distributed as an investigational new drug (IND) and as a licensed product — worldwide,* January 1978-September 1983

IND		Licensed product	
Year†	# Vials	Year§	# Vials
1978	1,558	1981	6,422
1979	2,038	1982	10,524
1980	2,139	1983	10,695
Total	**5,735**		**27,641**

*Includes a small, unknown number of vials distributed to Canada as an IND and a total of 3,451 vials distributed to 16 foreign countries as a licensed product (1981—139; 1982—1,884; and 1983 through September—1,428).

†January 1978 through November 1980.

§February 1981 through September 1983.

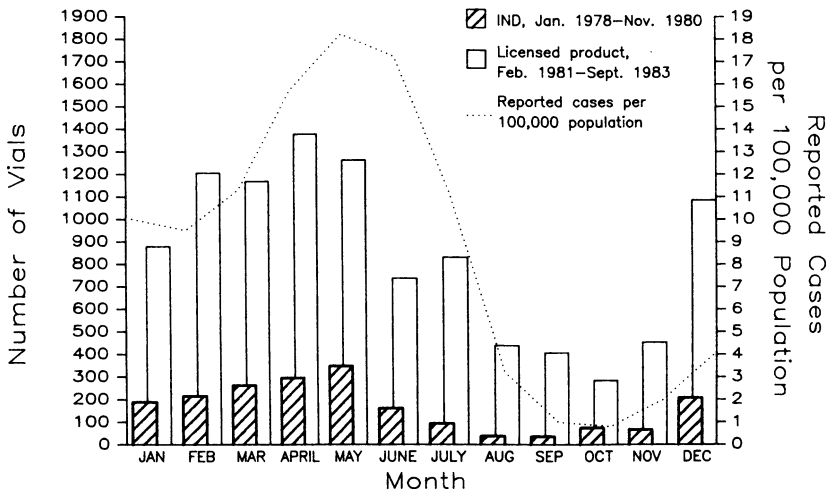
VZIG Distribution – Continued

Since there was little basis for projecting the potential demand for VZIG as a licensed product, VZIG initially was released on a case-by-case basis to ensure that the available supply was adequate to meet the most critical exposure situations (i.e., exposure involving susceptible, immunocompromised children). When it became evident that supplies were sufficient for all indicated applications, VZIG was distributed for use as physicians deemed appropriate. Although VZIG was intended primarily for use in high-risk neonates and susceptible immunocompromised children 15 years of age or younger (*1*), some physicians considered certain older individuals at increased risk of serious complications if infection occurred.

Although nationwide data on VZIG use in adults are not available, distribution of VZIG to adults in Massachusetts was evaluated by the MPHBL using information on the patients' underlying conditions, types of exposure, intervals between exposure and the VZIG request, and likelihood of previous infection. Between February 1, 1981, and September 30, 1983, 40 exposures were recorded among adults. These accounted for 12% of the 321 Massachusetts VZIG requests and 19% of the 1,028 vials distributed (five vials per adult exposure). Overall adult usage did not vary over this 3-year period. Age, which was known for 29 individuals, ranged from 16 to 73 years, with a mean and median of 37.4 years and 32.0 years, respectively.

The most frequently recorded indications judged appropriate by the requesting physicians for VZIG use were immunosuppression (secondary to radiation or chemotherapy) and pregnancy (12 patients each) (Table 2). Three of six pregnant women with known gestation were given VZIG in the first trimester. Twenty of the 32 known exposures occurred in households; two involved exposures of hospital personnel. The interval between exposure and VZIG request was known for 23 requests; three were beyond 96 hours (the recommended maximum interval between exposure and prophylaxis). One patient with Hodgkin's disease was given

FIGURE 1. Average monthly number of vials of varicella-zoster immune globulin distributed* as an investigational new drug (IND) and as a licensed product, January 1978 - September 1983,† and reported varicella cases, by month, 1981 — United States



*Includes a small, unknown number of vials distributed to Canada as an IND and a total of 3,451 vials distributed to 16 foreign countries as a licensed product.

†Data for December 1980 and January 1981 are lacking.

VZIG Distribution — Continued

VZIG 8 days after onset of zoster, which is not an indication for VZIG use. Two additional requests were made within 1 week of exposure. All patients had either negative or uncertain histories of previous varicella infection. Serologic testing was performed too infrequently to provide meaningful results.

Varicella developed in two of 29 adults (20 exposed in households) with known outcomes. Both involved household exposures—one in a parent of a child with varicella and one in a pregnant woman (VZIG had been administered 5 days and 2 days, respectively, after exposure). Both infections were mild. The outcome of the pregnancy is unknown. The observed clinical attack rate following household exposure of 10% (2/20) is lower than the expected 30%-50% rate in immunocompromised children with a negative or uncertain history of previous varicella (*3,4*), implying that many of these VZIG recipients were actually immune.

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Editorial Note: As expected, VZIG licensure has led to a substantial increase in VZIG use. Although supplies seem adequate, use should be restricted to high-risk individuals who are likely to be susceptible and who have experienced significant exposures. VZIG is not beneficial in cases of herpes zoster (*5,6*). Passive immunization also is not indicated for treating varicella (see page 96). It is not known whether the adult VZIG requests for pregnant women in Massachusetts were aimed at preventing maternal or fetal infection. VZIG use has not been shown to protect the fetus from infection and may provide a false sense of security. Decisions regarding VZIG use in pregnant women should be based on preventing serious illness in the mother, not on preventing infection in the fetus (*1*) (see page 95). Finally, excessive use of

TABLE 2. Underlying conditions of 40 adults receiving varicella-zoster immune globulin — Massachusetts, February 1981-September 30, 1983

	Conditions	Number of cases
A.	Adults undergoing chemotherapy or radiation because of:	
	1. Carcinoma (gastric, lung, renal, breast)	4
	2. Lymphoma	2
	3. Vasculitis	1
	4. Leukemia	3
	5. "Malignant disease"	1
	6. Asthma	1
	Total	**12**
B.	Pregnancy	12
C.	"Respiratory weakness"	1
D.	Bone-marrow transplant	1
E.	Chronic renal failure with low white blood cell count	1
F.	Systemic lupus erythematosus	1
G.	Severe rheumatoid arthritis	1
H.	Hodgkin's disease	2
I.	Chronic pulmonary disease	1
J.	Normal, healthy	4*
K.	Unknown	4
Total		**40**

*Includes two hospital personnel and two parents of children with varicella.

VZIG Distribution – Continued

VZIG can be minimized by realizing that most adults with negative histories of previous varicella are immune (*7-9*).

Detailed recommendations for VZIG administration have recently been published by the American Academy of Pediatrics (AAP) (*10*). The Immunization Practices Advisory Committee (ACIP) recommendations are published in this issue of the *MMWR*.

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Recommendations of the Immunization Practices Advisory Committee (ACIP)

Varicella-Zoster Immune Globulin for the Prevention of Chickenpox

This is the first statement by the Immunization Practices Advisory Committee (ACIP) on the use of varicella-zoster immune globulin (VZIG). Prior recommendations have been made by the manufacturer in cooperation with the Centers for Disease Control and approved by the Office of Biologics, National Center for Drugs and Biologics, U.S. Food and Drug Administration (FDA). Because of exceedingly limited supplies, VZIG use has been restricted to proven high-risk individuals—for prophylaxis against chickenpox in immunocompromised children and prevention of postnatal chickenpox following intrauterine exposure. With increasing supplies, some of these restrictions can be lifted. This statement includes use of VZIG for immunocompromised individuals of any age, normal adults, pregnant women, and premature and full-term infants. However, because the supply of VZIG is still limited, it continues to be recommended primarily for immunocompromised children and certain neonates exposed in utero. It should not be used indiscriminately.

INTRODUCTION

Chickenpox or varicella is usually a benign, highly contagious disease caused by varicella-zoster (V-Z) virus. The disease occurs primarily among preschool and young, school-aged children. More than 90% of cases are reported among persons under 15 years of age. Epidemiologic and serologic studies confirm that susceptibility among adults is substantially lower

VZIG for Prevention of Chickenpox – Continued

than among children. Varicella is highly communicable; secondary clinical attack rates of about 90% follow exposure of household contacts (*1*). The period of communicability of patients with varicella is estimated to range from 1 to 2 days before rash onset through the first 5-6 days after rash onset. Persons with progressive varicella may be communicable for longer periods, presumably because their immune response is to some degree depressed, allowing viral replication to persist.

Because of the large number of varicella cases among normal children, children account for the greatest number of complications from this disease. However, the risk of complications for normal children is small compared to that for immunocompromised* children, whose varicella can frequently be life-threatening. The risk of serious morbidity and mortality from varicella is directly related to host immunodeficiency.

Varicella can also be life-threatening to neonates who acquire infection transplacentally just before delivery. Term infants born to women who had onset of varicella rash within 4 days before delivery appear to have an increased mortality rate from varicella. Infants born to mothers with onsets of varicella rash 5 or more days before delivery usually have a benign course, presumably because of passive transfer of maternal antibody.

Although intrauterine infection acquired shortly before delivery increases the risk of neonatal complications, infection of mothers during the first 16 weeks of pregnancy only rarely leads to fetal damage (low birth weight, hypotrophic limbs, ocular abnormalities, brain damage, and mental retardation). This "syndrome" is so uncommon that two large studies of pregnancies complicated by varicella have not shown an increased incidence rate of congenital defects compared with controls (*2,3*). However, review of available case records clearly supports its existence.

Although few adults are susceptible to varicella, those who develop the disease are more likely to experience complications. Persons 20 years of age or older account for a disproportionate amount of encephalitis and death. Although less than 2% of reported cases occur among individuals 20 years of age or older, almost a quarter of all the mortality is reported in this age group. Pneumonia also appears to be more common among adults with varicella.

Following chickenpox, V-Z virus may persist in latent form without clinical manifestations. Upon reactivation, the latent virus can cause zoster or "shingles," a painful, vesicular, pustular eruption in the distribution of one or more sensory-nerve roots. Zoster is more common among the elderly and among immunocompromised patients, who are also more prone than the general population to develop disseminated zoster with generalized skin eruptions and central nervous system, pulmonary, hepatic, and pancreatic involvement.

PREVENTION OF VARICELLA BY VARICELLA-ZOSTER IMMUNE GLOBULIN

In 1969, zoster immune globulin (ZIG), prepared from patients convalescing from herpes zoster, was shown to prevent clinical varicella in susceptible, normal children if administered within 72 hours after exposure. Subsequent uncontrolled studies of immunocompromised patients who received ZIG after exposure to V-Z virus showed that they also tended to have lower-than-expected clinical attack rates and higher-than-expected rates of subclinical infection when ZIG was administered no later than 96 hours after exposure. Patients who became ill tended to have modified illnesses with a low complication rate. The efficacy of ZIG in immunocompromised persons was further demonstrated by a study comparing the use of low-titer

*Immunocompromised persons include individuals with congenital or acquired immunodeficiency diseases and persons with suppressed immune responses, such as those that occur with leukemia, lymphoma, generalized malignancy, and therapy with immunosuppressive drugs, including steroids, alkylating drugs, antimetabolites, or radiation.

VZIG for Prevention of Chickenpox — Continued

versus high-titer lots; patients who received the high-titer ZIG had significantly lower risks of complications.

In 1978, VZIG became available. Both serologic and clinical evaluations have demonstrated that the product is equivalent to ZIG in preventing or modifying clinical illness in susceptible, immunocompromised patients exposed to varicella. VZIG has been licensed by FDA's Office of Biologics. VZIG is prepared from plasma found in routine screening of normal, volunteer blood donors to contain high antibody titers to V-Z. VZIG (Human) is a sterile, 10%-18% solution of the globulin fraction of human plasma, primarily immunoglobulin G (IgG) in 0.3M glycine as a stabilizer and 1:10,000 thimerosol as a preservative. It is prepared by Cohn cold ethanol precipitation.

ZIG was in short supply because of the continuous need to find new donors convalescing from herpes zoster. Because of the method of routinely screening plasma from regular blood donors for high titers of V-Z antibody and using those units to prepare VZIG, supplies became substantially greater.

INDICATIONS FOR USE

When deciding whether to administer VZIG, the clinician must determine whether the patient is likely to be susceptible, whether the exposure is likely to result in infection, and whether the patient is at greater risk of complications from varicella than the general population. Whereas risks of VZIG administration appear to be negligible, costs of administration can be substantial (approximately $75 per 125 units,[†] or $375 for persons over 40 kg [88 lbs] of body weight, i.e., for the maximum recommended dose). In addition, it is not known whether modified infection will lead to lifelong immunity or whether modified infections will increase or decrease the risk of later developing zoster. The following recommendations are made taking these factors into account. In some instances, VZIG is routinely recommended; in others, administration should be evaluated on an individual basis.

Determination of Susceptibility

Both normal and immunocompromised adults and children, who are believed to have had varicella based on a carefully obtained history by an experienced interviewer, can be considered immune[§] (Table 3). Reports of second attacks of clinical varicella are rare.

Since subclinical primary infections appear rare (less than 5% of infections among normal children), children (under 15 years old) without histories of clinical varicella should be considered susceptible unless proven otherwise (see below). On the other hand, most normal adults with negative or unknown histories of varicella are probably immune, since attack rates of varicella in such adults after household or hospital exposure have ranged from only 5% to 15%.[¶]

Antibody Assays: Laboratory determination of susceptibility to varicella is often impractical. The most commonly available serologic assay for varicella antibodies, the complement-fixation (CF) test, is insensitive and may not be specific, particularly at low titers. One year after clinical varicella, approximately two of three patients will lack detectable CF antibody to varicella.

Other antibody assays are more sensitive and specific indicators of varicella immunity in normal hosts but are not generally available. These tests include fluorescent antibody against

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[†]VZIG is, however, distributed free-of-charge to Massachusetts residents.

[§]Except bone marrow recipients.

[¶]Susceptibility rates of adults who were raised in some tropical areas, such as Puerto Rico, and particularly remote areas may be somewhat higher.

VZIG for Prevention of Chickenpox – Continued

membrane antigen (FAMA), immune adherence hemagglutination (IAHA), enzyme-linked immunosorbent assay (ELISA), and neutralizing antibody. Commercial kits are available that utilize these sensitive antibody detection methods, although they have not been fully evaluated, particularly in immunocompromised populations.** When sensitive tests are available, they can be used when a determination of susceptibility is necessary.

In some instances, there have been difficulties in interpreting results of some current sensitive antibody assays in immunocompromised persons. Low levels of such antibodies have been detected in the sera of some immunocompromised persons lacking histories of chickenpox who subsequently developed clinical varicella. While present, these antibodies did not prevent illness. Presumably, most if not all these persons had passively acquired antibodies as a result of recent transfusions of blood, blood derivatives, or blood products containing antibody. Investigation of other immunocompromised persons has demonstrated that serum antibodies are frequently present following transfusions. In addition, some of these sensitive antibody assays may be measuring nonspecific activity rather than antibody. Little is known about the cellular immune status of immunocompromised individuals. Therefore, until data are collected that allow further evaluation of serologic tests in the immunocompromised, in routine circumstances, one may need to rely primarily on a carefully obtained history of prior clinical chickenpox to define susceptibility. The history should be taken by an experienced interviewer. Additional studies to evaluate serologic tests of immunocompromised patients are in progress.

In addition, sensitive antibody assays may not be useful in assessing the likelihood that neonates and young infants exposed to varicella will develop clinical disease. Some infants

**Some research laboratories have used experimental varicella skin-test antigens on a limited basis in selected populations, but their utility in routine screening programs has not been established.

TABLE 3. Determination of susceptibility to varicella in some selected situations*

Group	Immune status	Carefully obtained prior history of varicella	Detectable varicella antibody by a reliable test†	Susceptibility status
Children (< 15 yrs)	immuno-compromised	yes →	unnecessary to perform →	immune
		no or unknown →	§ →	susceptible
Adolescents and adults (≥ 15 yrs)	normal	yes →	unnecessary to perform →	immune
		no or unknown →	not performed →	generally consider immune¶
			yes →	immune
			no →	susceptible
	immuno-compromised	yes →	unnecessary to perform →	immune
		no or unknown →	§ →	consider susceptible¶

*This table provides general guidelines for determining susceptibility in frequently encountered situations. Not all potential scenarios are considered. In all situations, individual judgment should also be used. See text for details.

†Reliable tests are discussed in the text.

§Some immunocompromised persons with detectable antibody before VZIG administration, presumably passively transferred by recent transfusions, have developed clinical varicella. Until further evaluation of serologic tests in the immunocompromised has been completed, one may have to rely on a carefully obtained clinical history by an experienced interviewer to determine susceptibility (i.e., the absence of a history of clinical varicella).

¶More than 85% and probably more than 95% of such persons are immune.

VZIG for Prevention of Chickenpox — Continued

have developed varicella after exposure, despite the presence of detectable antibody, although in most circumstances, such illnesses have been of modified severity.

Bone Marrow Recipients: Because data correlating a prior history of varicella in the bone marrow donor or recipient with actual immunity to chickenpox in the recipient are lacking, children or adults who have received bone marrow transplants should be considered susceptible, regardless of prior histories of clinical chickenpox either in themselves or in the transplant donor. However, bone marrow recipients who develop varicella or zoster following transplantation can subsequently be considered immune.

TYPES OF EXPOSURE

Several types of exposure are likely to place a susceptible person at risk for varicella (Table 4); persons continuously exposed in the household to patients with varicella are at greatest risk. Approximately 90% of such exposed, susceptible patients contract varicella after a single exposure. Data are not available from immunocompromised susceptible populations to directly compare the risk of varicella after playmate or hospital exposure with the risk after household exposure. However, clinical attack rates among immunocompromised patients treated with VZIG allow some comparison; approximately one-third to one-half of VZIG-treated immunocompromised children with negative histories of prior varicella become ill after household exposure. The risks of disease following playmate and hospital exposure are approximately one-fifth the risk after household exposure. Significant playmate contact generally consists of longer than 1 hour of play indoors. Significant exposure for hospital contacts consists either of sharing the same two- to four-bed hospital room with an infectious patient or of prolonged, direct face-to-face contact with an infectious person (e.g., nurses or doctors who care for the patient). Transient contacts (e.g., x-ray technicians and maintenance personnel) are less likely to result in transmission than more prolonged contacts.

The clinical attack rate in VZIG-treated, normal infants who have been exposed in utero shortly before delivery is as high as 30%-40%, which is not substantially different from reported rates without VZIG. However, complications are much lower in VZIG-treated infants.

RECOMMENDATIONS FOR USE OF VZIG

Infants and Children

Immunocompromised Children: The most important use of VZIG is for passive immunization of susceptible, immunocompromised children after significant exposure to chickenpox or zoster (Table 5). This includes children with primary immune deficiency disorders and neoplastic diseases and children currently receiving immunosuppressive treatment.

Newborns of Mothers with Varicella Shortly before Delivery: VZIG is indicated for newborns of mothers who develop chickenpox within 5 days before and 48 hours after delivery.

TABLE 4. Exposure criteria for which varicella-zoster immune globulin (VZIG) is indicated*

1. One of the following types of exposure to persons with chickenpox or zoster:
   a. Continuous household contact.
   b. Playmate contact (generally > 1 hour of play indoors).
   c. Hospital contact (in same two- to four-bed room or adjacent beds in a large ward or prolonged face-to-face contact with an infectious staff member or patient).
   d. Newborn contact (newborn of mother who had onset of chickenpox 5 days or less before delivery or within 48 hours after delivery).

   AND
2. Time elapsed after exposure is such that VZIG can be administered within 96 hours but preferably sooner.

*Patients should meet both criteria.

VZIG for Prevention of Chickenpox – Continued

VZIG is probably not necessary for newborns whose mothers develop varicella more than 5 days before delivery, since those infants should be protected from complications of varicella by transplacentally-acquired maternal antibody. There is no evidence to suggest that infants born to mothers who develop varicella more than 48 hours after delivery are at increased risk of complications of disease.

Postnatal Exposure of Newborn Infants: Premature infants who have significant postnatal exposure should be evaluated on an individual basis. Most premature infants of 28 weeks' gestation or more will have transplacentally-acquired maternal antibodies and are protected from complications of disease if the mother is immune. The risk of complications of postnatally-acquired varicella in the premature infant is unknown. However, since their immune systems may be compromised, it seems prudent to administer VZIG to exposed premature infants whose mothers have negative or uncertain histories of varicella. Such infants should be considered at risk as long as they require continued hospital care. Exposed infants of less than 28 weeks' gestation or birth weight of 1,000 g or less probably should receive VZIG regardless of maternal history, because they may not yet have acquired transplacental maternal antibody.

Normal-term infants who develop varicella following postnatal exposure are not known to be at any greater risk from complications of chickenpox than older children. VZIG is not recommended for normal-term infants exposed postnatally even if their mothers do not have a prior history of varicella.

Adults

Immunocompromised Adults: The complication rate for immunocompromised adults who contract varicella is likely to be substantially greater than for normal adults. Most (85%-95%) immunocompromised adults with negative or unknown histories of prior varicella are likely to be immune. After careful evaluation, adults who are believed susceptible and who have had significant exposures should receive VZIG to prevent complications.

Normal Adults: Chickenpox can be severe in normal adults. Based on available epidemiologic and clinical data, normal adults who develop varicella have a ninefold to 25-fold greater risk of complications, including death, than normal children. The estimated risk of death following varicella in normal adults is 50/100,000, compared with an estimated 2/100,000

TABLE 5. Candidates for whom varicella-zoster immune globulin (VZIG) is indicated.*

1. Susceptible to varicella-zoster (see text and Table 3).
2. Significant exposure (see Table 4).
3. Age of < 15 years, with administration to immunocompromised adolescents and adults and to other older patients on an individual basis (see text).
4. One of the following underlying illnesses or conditions:
   a. Leukemia or lymphoma.
   b. Congenital or acquired immunodeficiency.
   c. Immunosuppressive treatment.
   d. Newborn of mother who had onset of chickenpox within 5 days before delivery or within 48 hours after delivery.
   e. Premature infant (≥ 28 weeks' gestation) whose mother lacks a prior history of chickenpox.
   f. Premature infants (< 28 weeks' gestation or ≤ 1,000 g) regardless of maternal history.

*Patients should meet the four criteria for VZIG candidates.

VZIG for Prevention of Chickenpox — Continued

among normal children. The decision to administer VZIG to an adult should be evaluated on an individual basis. Approximately 85%-95% of adults with negative or uncertain histories of varicella will be immune. The objective is to modify rather than prevent illness in hopes of inducing lifelong immunity. The clinician should consider the patient's health status, type of exposure, and likelihood of previous infection when deciding whether to administer VZIG. Adults who are older siblings of large families and adults whose children have had varicella are probably immune. If sensitive laboratory screening tests for varicella are available, they might be used to determine susceptibility, if time permits. If, after careful evaluation, a normal adult with significant exposure to varicella is believed susceptible, VZIG may be administered. However, it should be noted that VZIG supplies are still limited and that the cost of VZIG is substantial (an adult dose costs $375).

Indiscriminate use of VZIG in normal adults would quickly exhaust supplies and prevent prophylaxis of known high-risk individuals, such as immunocompromised children and high-risk neonates. Persons in the latter two groups who develop varicella have estimated death-to-case ratios of at least 7,000/100,000 and 31,000/100,000, respectively, compared with 50/100,000 for normal adults.

(Continued on page 95)

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

Disease	7th Week Ending			Cumulative, 7th Week Ending		
	February 18, 1984	February 19, 1983	Median 1979-1983	February 18, 1984	February 19, 1983	Median 1979-1983
Acquired Immunodeficiency Syndrome (AIDS)	54	N	N	372	N	N
Aseptic meningitis	34	57	57	559	596	448
Encephalitis: Primary (arthropod-borne & unspec.)	8	11	11	88	117	104
Post-infectious	1	-	1	5	5	12
Gonorrhea: Civilian	14,222	15,664	17,376	109,237	124,409	128,379
Military	394	333	494	2,795	3,388	3,821
Hepatitis: Type A	334	380	597	2,706	3,089	3,121
Type B	317	353	332	2,712	2,733	2,293
Non A, Non B	34	45	N	372	371	N
Unspecified	103	118	187	756	895	1,262
Legionellosis	7	5	N	50	65	N
Leprosy	-	2	3	24	33	30
Malaria	4	9	13	61	82	85
Measles: Total*	9	10	34	175	62	233
Indigenous	9	9	N	168	43	N
Imported	-	1	N	7	19	N
Meningococcal infections: Total	68	57	67	367	401	410
Civilian	68	57	66	367	392	408
Military	-	-	-	-	9	2
Mumps	68	60	135	427	522	714
Pertussis	23	28	25	192	141	135
Rubella (German measles)	5	17	48	53	100	299
Syphilis (Primary & Secondary): Civilian	542	574	574	3,718	4,593	3,992
Military	5	15	7	45	79	56
Toxic Shock syndrome	7	3	N	38	55	N
Tuberculosis	368	407	454	2,363	2,587	2,888
Tularemia	1	3	1	9	17	12
Typhoid fever	3	8	7	24	42	46
Typhus fever, tick-borne (RMSF)	1	3	1	7	10	8
Rabies, animal	62	74	74	463	610	610

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1984		Cum. 1984
Anthrax	-	Plague	2
Botulism: Foodborne	-	Poliomyelitis: Total	-
Infant	5	Paralytic	-
Other	1	Psittacosis	9
Brucellosis (Iowa 1, Tex. 1)	14	Rabies, human	-
Cholera	-	Tetanus	3
Congenital rubella syndrome	-	Trichinosis	2
Diphtheria	-	Typhus fever, flea-borne (endemic, murine) (Tex. 1, Hawaii 1)	4
Leptospirosis	2		

*There were no cases of internationally imported measles reported for this week.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending February 18, 1984 and February 19, 1983 (7th Week)

Reporting Area	AIDS	Aseptic Menin-gitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionel-losis	Leprosy
			Primary	Post-in-fectious			A	B	NA,NB	Unspeci-fied		
	Cum. 1984	1984	Cum. 1984	Cum. 1984	Cum. 1984	Cum. 1983	1984	1984	1984	1984	1984	Cum. 1984
UNITED STATES	372	34	88	5	109,237	124,409	334	317	34	103	7	24
NEW ENGLAND	15	4	4	-	3,731	3,211	8	18	2	20	-	1
Maine	-	-	-	-	142	184	1	1	-	-	-	-
N.H.	-	-	1	-	79	91	3	2	-	-	-	-
Vt.	-	-	-	-	53	57	-	-	-	-	-	-
Mass.	8	4	3	-	1,440	1,465	3	8	-	20	-	1
R.I.	-	-	-	-	187	175	-	-	-	-	-	-
Conn.	7	-	-	-	1,830	1,239	1	7	2	-	-	-
MID ATLANTIC	195	4	7	-	14,081	15,596	75	57	1	11	-	2
Upstate N.Y.	-	2	3	-	2,061	2,134	5	12	-	2	-	2
N.Y. City	178	-	-	-	6,261	6,391	61	29	-	6	-	-
N.J.	17	-	2	-	1,894	3,068	9	16	1	3	-	-
Pa.	-	2	2	-	3,865	4,003	-	-	-	-	-	-
E.N. CENTRAL	16	9	18	1	14,035	17,769	36	47	6	6	2	1
Ohio	8	2	6	1	4,060	4,984	12	7	1	2	1	-
Ind.	-	1	1	-	1,921	1,804	6	7	1	1	-	-
Ill.	7	3	2	-	1,986	4,594	6	8	2	2	-	-
Mich.	1	3	6	-	4,414	4,880	12	25	2	1	1	1
Wis.	-	-	3	-	1,654	1,507	-	-	-	-	-	-
W.N. CENTRAL	1	-	3	-	5,124	5,799	18	18	4	1	-	-
Minn.	-	-	-	-	727	917	2	2	3	-	-	-
Iowa	1	-	2	-	619	598	1	3	-	-	-	-
Mo.	-	-	-	-	2,308	2,729	2	9	1	1	-	-
N. Dak.	-	-	-	-	54	59	-	-	-	-	-	-
S. Dak.	-	-	-	-	173	172	10	-	-	-	-	-
Nebr.	-	-	-	-	376	327	2	1	-	-	-	-
Kans.	-	-	1	-	867	997	1	3	-	-	-	-
S. ATLANTIC	42	7	21	4	28,597	30,583	26	78	10	9	1	1
Del.	1	-	1	-	494	639	-	1	-	-	-	-
Md.	12	-	4	-	3,803	3,939	1	7	2	3	-	-
D.C.	6	-	-	-	1,986	1,956	-	3	-	-	-	-
Va.	2	3	7	3	2,870	2,800	1	11	2	-	-	1
W. Va.	-	-	2	-	310	322	1	-	-	-	-	-
N.C.	-	1	1	1	4,563	4,243	1	11	2	1	-	-
S.C.	-	-	1	-	2,606	3,205	1	12	-	-	-	-
Ga.	-	-	2	-	5,579	5,862	7	14	1	1	-	-
Fla.	21	3	3	-	6,386	7,617	14	19	3	4	1	-
E.S. CENTRAL	1	4	3	-	9,547	10,911	13	30	3	-	-	-
Ky.	1	2	-	-	1,169	1,454	13	12	-	-	-	-
Tenn.	-	-	1	-	3,832	4,103	-	6	2	-	-	-
Ala.	-	1	2	-	3,151	3,487	-	8	1	-	-	-
Miss.	-	1	-	-	1,395	1,867	-	4	-	-	-	-
W.S. CENTRAL	4	1	6	-	15,547	17,628	82	35	4	48	1	-
Ark.	-	-	-	-	1,332	1,394	-	-	-	3	1	-
La.	-	-	1	-	3,631	2,665	7	6	-	1	-	-
Okla.	1	1	-	-	1,759	2,149	10	2	1	5	-	-
Tex.	3	-	5	-	8,825	11,420	65	27	3	39	-	-
MOUNTAIN	4	5	1	-	3,425	3,644	46	30	2	7	2	4
Mont.	-	-	-	-	182	184	-	-	-	-	-	-
Idaho	-	-	-	-	136	177	3	2	1	-	-	-
Wyo.	-	-	-	-	87	111	1	-	-	-	-	-
Colo.	-	4	-	-	864	1,034	18	10	-	3	-	-
N. Mex.	-	-	-	-	438	489	3	1	-	-	-	-
Ariz.	4	1	-	-	934	855	15	11	1	1	2	4
Utah	-	-	1	-	190	168	1	-	-	3	-	-
Nev.	-	-	-	-	594	626	5	6	-	-	-	-
PACIFIC	94	-	25	-	15,150	19,268	30	4	2	1	1	15
Wash.	1	-	-	-	1,004	1,283	6	-	-	-	1	1
Oreg.	-	-	-	-	921	917	23	3	2	1	-	-
Calif.	92	U	25	-	12,614	16,296	U	U	U	U	U	11
Alaska	-	-	-	-	362	405	-	1	-	-	-	-
Hawaii	1	-	-	-	249	367	1	-	-	-	-	3
Guam	-	U	-	-	-	33	U	U	U	U	U	-
P.R.	-	-	-	-	462	432	8	9	-	10	-	-
V.I.	-	-	-	-	62	32	-	-	-	-	-	-
Pac. Trust Terr.	-	U	-	-	-	-	U	U	U	U	U	-

N: Not notifiable U: Unavailable

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending February 18, 1984 and February 19, 1983 (7th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported *		Total									
	Cum. 1984	1984	Cum. 1984	1984	Cum. 1984	Cum. 1983	Cum. 1984	1984	Cum. 1984	1984	Cum. 1984	Cum. 1983	1984	Cum. 1984	Cum. 1983
UNITED STATES	61	9	168	-	7	62	367	68	427	23	192	141	5	53	100
NEW ENGLAND	8	-	1	-	-	-	20	7	20	-	3	9	-	2	1
Maine	-	-	-	-	-	-	-	1	6	-	-	-	-	1	-
N.H.	-	-	1	-	-	-	2	-	1	-	1	3	-	-	-
Vt.	1	-	-	-	-	-	3	-	1	-	1	1	-	-	1
Mass.	5	-	-	-	-	-	8	5	11	-	-	4	-	1	-
R.I.	-	-	-	-	-	-	3	1	1	-	1	1	-	-	-
Conn.	2	-	-	-	-	-	4	-	-	-	-	-	-	-	-
MID ATLANTIC	3	3	3	-	-	2	39	11	76	9	16	28	-	-	3
Upstate N.Y.	2	-	-	-	-	1	16	4	16	3	8	16	-	-	1
N.Y. City	-	3	3	-	-	1	1	2	3	-	-	3	-	-	2
N.J.	-	-	-	-	-	-	9	1	50	-	-	3	-	-	-
Pa.	1	-	-	-	-	-	13	4	7	6	8	6	-	-	-
E.N. CENTRAL	7	-	101	-	-	22	60	25	129	9	43	45	-	4	17
Ohio	4	-	-	-	-	-	23	10	35	7	12	19	-	-	1
Ind.	-	-	-	-	-	-	7	-	11	1	20	3	-	-	-
Ill.	1	-	15	-	-	17	8	9	40	-	3	16	-	3	6
Mich.	1	-	86	-	-	5	15	6	36	-	4	1	-	1	2
Wis.	1	-	-	-	-	-	7	-	7	1	4	6	-	-	8
W.N. CENTRAL	3	-	-	-	-	-	29	6	22	-	42	9	1	4	9
Minn.	-	-	-	-	-	-	2	-	1	-	2	-	-	-	2
Iowa	-	-	-	-	-	-	10	2	5	-	3	2	-	-	-
Mo.	2	-	-	-	-	-	10	-	4	-	1	2	-	-	-
N. Dak.	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
S. Dak.	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Nebr.	-	-	-	-	-	-	2	-	1	-	-	-	-	-	-
Kans.	1	-	-	-	-	-	4	4	11	-	36	5	1	3	7
S. ATLANTIC	9	-	-	-	-	10	102	4	39	3	26	21	3	6	6
Del.	2	-	-	-	-	-	1	-	1	-	-	-	-	-	-
Md.	3	-	-	-	-	-	6	2	8	-	1	3	-	-	-
D.C.	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
Va.	2	-	-	-	-	2	6	-	2	1	5	7	-	-	-
W. Va.	-	-	-	-	-	-	2	1	6	1	3	1	-	-	-
N.C.	1	-	-	-	-	-	16	-	3	1	8	-	-	-	-
S.C.	1	-	-	-	-	1	11	-	1	-	1	-	-	-	-
Ga.	-	-	-	-	-	-	27	-	3	-	2	9	-	1	2
Fla.	-	-	-	-	-	7	31	1	15	-	6	1	3	5	4
E.S. CENTRAL	-	-	-	-	2	-	18	1	8	-	2	-	-	-	1
Ky.	-	-	-	-	-	-	4	-	3	-	1	-	-	-	1
Tenn.	-	-	-	-	2	-	7	-	-	-	1	-	-	-	-
Ala.	-	-	-	-	-	-	5	1	3	-	-	-	-	-	-
Miss.	-	-	-	-	-	-	2	-	2	-	-	-	-	-	-
W.S. CENTRAL	-	3	33	-	-	-	34	6	14	1	11	14	1	9	18
Ark.	-	-	-	-	-	-	2	-	-	1	10	1	-	1	-
La.	-	-	-	-	-	-	3	-	-	-	-	2	-	-	-
Okla.	-	-	-	-	-	-	5	N	N	-	1	4	-	-	-
Tex.	-	3	33	-	-	-	24	6	14	-	-	7	1	8	18
MOUNTAIN	1	-	18	-	-	1	16	8	50	1	33	11	-	3	4
Mont.	-	-	-	-	-	-	1	-	1	1	18	1	-	-	1
Idaho	-	-	-	-	-	-	3	-	3	-	1	-	-	1	-
Wyo.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Colo.	-	-	-	-	-	1	7	1	1	-	11	5	-	-	-
N. Mex.	-	-	-	-	-	-	1	N	N	-	2	4	-	-	-
Ariz.	1	-	-	-	-	-	1	7	44	-	-	-	-	-	1
Utah	-	-	18	-	-	-	3	-	1	-	1	1	-	2	1
Nev.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PACIFIC	30	3	12	-	5	27	49	-	69	-	16	4	-	25	41
Wash.	2	3	5	-	-	-	3	-	12	-	6	-	-	-	-
Oreg.	1	-	-	-	-	1	11	N	N	-	4	-	-	-	2
Calif.	25	U	7	U	3	25	33	U	53	U	6	4	U	24	39
Alaska	-	-	-	-	-	-	2	-	3	-	-	-	-	-	-
Hawaii	2	-	-	-	2	1	-	-	1	-	-	-	-	1	-
Guam	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
P.R.	2	-	-	-	-	15	1	1	20	-	-	1	-	1	-
V.I.	-	-	-	-	-	5	-	-	-	-	-	-	-	-	1
Pac. Trust Terr.	-	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 III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending February 18, 1984 and February 19, 1983 (7th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1984	Cum. 1983	1984	Cum. 1984	Cum. 1983	Cum. 1984	Cum. 1984	Cum. 1984	Cum. 1984
UNITED STATES	3,718	4,593	7	2,363	2,587	9	24	7	463
NEW ENGLAND	92	113	-	72	53	-	-	-	2
Maine	1	-	-	4	5	-	-	-	2
N.H.	-	1	-	5	5	-	-	-	-
Vt.	-	1	-	3	-	-	-	-	-
Mass.	59	81	-	33	21	-	-	-	-
R.I.	4	2	-	10	6	-	-	-	-
Conn.	28	28	-	17	16	-	-	-	-
MID ATLANTIC	515	511	-	460	486	-	3	-	35
Upstate N.Y.	32	29	-	72	96	-	1	-	1
N.Y. City	294	304	-	177	189	-	-	-	-
N.J.	111	96	-	99	104	-	2	-	-
Pa.	78	82	-	112	97	-	-	-	34
E.N. CENTRAL	130	271	2	325	400	-	4	1	16
Ohio	35	84	2	78	66	-	2	1	2
Ind.	29	28	-	32	61	-	1	-	3
Ill.	17	111	-	122	190	-	-	-	5
Mich.	34	32	-	76	64	-	-	-	1
Wis.	15	16	-	17	19	-	1	-	5
W.N. CENTRAL	64	53	1	55	83	4	1	2	65
Minn.	12	27	-	8	10	-	1	-	10
Iowa	5	2	-	9	15	-	-	-	16
Mo.	38	18	-	23	45	4	-	2	6
N. Dak.	-	-	-	2	-	-	-	-	12
S. Dak.	-	-	1	1	5	-	-	-	12
Nebr.	4	1	-	5	2	-	-	-	5
Kans.	5	5	-	7	6	-	-	-	4
S. ATLANTIC	1,174	1,187	2	548	520	-	2	1	163
Del.	1	9	-	4	1	-	-	-	-
Md.	57	65	-	73	39	-	-	-	113
D.C.	37	49	-	10	20	-	-	-	-
Va.	60	89	-	43	31	-	1	-	31
W. Va.	5	2	-	18	28	-	-	-	3
N.C.	124	108	1	101	46	-	-	-	-
S.C.	119	107	-	78	51	-	-	-	-
Ga.	204	199	1	63	110	-	-	-	15
Fla.	567	559	-	158	194	-	1	1	1
E.S. CENTRAL	274	315	-	235	261	-	2	2	17
Ky.	14	21	-	62	80	-	-	-	3
Tenn.	61	79	-	77	79	-	2	1	7
Ala.	91	140	-	80	67	-	-	1	7
Miss.	108	75	-	16	35	-	-	-	-
W.S. CENTRAL	908	1,111	-	203	235	2	1	1	110
Ark.	31	17	-	6	11	-	-	1	10
La.	193	191	-	26	58	-	1	-	-
Okla.	23	34	-	27	39	2	-	-	12
Tex.	661	869	-	144	127	-	-	-	88
MOUNTAIN	74	98	2	36	79	3	2	-	14
Mont.	-	2	-	1	6	-	1	-	9
Idaho	4	1	-	3	5	-	-	-	-
Wyo.	1	2	1	-	2	-	-	-	-
Colo.	10	20	-	-	5	-	-	-	-
N. Mex.	8	37	-	9	16	-	1	-	1
Ariz.	28	19	-	19	36	1	-	-	4
Utah	3	5	1	3	4	2	-	-	-
Nev.	20	12	-	1	5	-	-	-	-
PACIFIC	487	934	-	429	470	-	9	-	41
Wash.	12	35	-	14	25	-	-	-	-
Oreg.	15	13	-	18	21	-	-	-	-
Calif.	447	870	U	357	385	-	7	-	40
Alaska	-	6	-	8	4	-	-	-	1
Hawaii	13	10	-	32	35	-	2	-	-
Guam	-	-	U	-	1	-	-	-	-
P.R.	138	97	-	27	76	-	1	-	5
V.I.	2	1	-	-	-	-	-	-	-
Pac. Trust Terr.	-	-	U	-	-	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending February 18, 1984 (7th Week)

Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	716	498	140	43	16	19	66
Boston, Mass.	189	112	46	14	8	9	20
Bridgeport, Conn.	62	47	9	4	1	1	6
Cambridge, Mass.	29	23	4	2	-	-	1
Fall River, Mass.	32	26	6	-	-	-	1
Hartford, Conn.	65	48	11	2	1	3	3
Lowell, Mass.	28	19	9	-	-	-	3
Lynn, Mass.	11	7	2	2	-	-	-
New Bedford, Mass.	25	20	4	-	1	-	5
New Haven, Conn.	53	42	4	5	1	1	-
Providence, R.I.	62	41	13	6	1	1	8
Somerville, Mass.	16	14	1	-	1	-	-
Springfield, Mass.	35	25	8	-	1	1	5
Waterbury, Conn.	34	26	6	2	-	-	3
Worcester, Mass.	75	48	17	6	1	3	11
MID. ATLANTIC	2,735	1,846	597	185	53	54	149
Albany, N.Y.	66	46	15	-	3	2	5
Allentown, Pa.	23	17	6	-	-	-	1
Buffalo, N.Y.	107	77	21	7	1	1	11
Camden, N.J.	50	23	17	5	2	3	3
Elizabeth, N.J.	36	30	4	2	-	-	2
Erie, Pa.†	51	38	12	-	1	-	5
Jersey City, N.J.	51	35	12	-	1	3	-
N.Y. City, N.Y.	1,529	1,020	319	131	29	30	75
Newark, N.J.	34	19	9	5	-	1	3
Paterson, N.J.	35	25	9	-	-	1	3
Philadelphia, Pa.†	295	191	85	10	4	5	17
Pittsburgh, Pa.†	61	40	16	3	2	-	1
Reading, Pa.	41	32	7	2	-	-	2
Rochester, N.Y.	127	94	16	8	3	6	9
Schenectady, N.Y.	25	16	5	2	2	-	3
Scranton, Pa.†	26	20	5	-	1	-	1
Syracuse, N.Y.	86	54	24	3	3	2	2
Trenton, N.J.	38	26	7	4	1	-	-
Utica, N.Y.	22	18	4	-	-	-	2
Yonkers, N.Y.	32	25	4	3	-	-	4
E.N. CENTRAL	2,516	1,764	460	118	77	85	108
Akron, Ohio	64	37	20	2	4	1	-
Canton, Ohio	54	36	15	-	2	1	2
Chicago, Ill §	614	535	11	12	21	23	14
Cincinnati, Ohio	284	192	68	12	6	6	29
Cleveland, Ohio	148	83	45	8	5	7	4
Columbus, Ohio	134	88	24	12	5	5	7
Dayton, Ohio	115	68	32	10	3	2	2
Detroit, Mich.	275	164	72	19	11	9	10
Evansville, Ind.	71	55	11	2	2	1	2
Fort Wayne, Ind.	54	36	17	-	-	1	3
Gary, Ind.	17	9	7	1	-	-	-
Grand Rapids, Mich.	74	52	16	3	1	2	5
Indianapolis, Ind.	152	92	33	15	4	8	4
Madison, Wis.	44	23	13	3	3	2	4
Milwaukee, Wis.	121	86	23	2	4	6	6
Peoria, Ill.	61	44	7	6	-	4	8
Rockford, Ill.	29	21	4	-	1	3	1
South Bend, Ind.	53	34	12	3	1	3	4
Toledo, Ohio	92	64	17	6	4	1	2
Youngstown, Ohio	60	45	13	2	-	-	1
W.N. CENTRAL	661	431	150	34	17	28	46
Des Moines, Iowa	63	49	7	3	2	2	5
Duluth, Minn.	18	11	3	1	-	3	1
Kansas City, Kans.	33	15	13	2	1	2	2
Kansas City, Mo.	121	69	29	9	5	8	5
Lincoln, Nebr.	23	16	7	-	-	-	3
Minneapolis, Minn.	74	44	20	2	3	5	2
Omaha, Nebr.	80	59	15	3	1	2	7
St. Louis, Mo.	130	86	32	8	-	4	15
St. Paul, Minn.	58	42	12	2	2	-	3
Wichita, Kans.	61	40	12	4	3	2	3
S. ATLANTIC	1,297	763	338	102	47	47	59
Atlanta, Ga.	150	87	40	13	6	4	2
Baltimore, Md.	124	80	31	5	5	3	2
Charlotte, N.C.	91	37	38	8	5	3	2
Jacksonville, Fla.	127	74	30	16	4	3	11
Miami, Fla.	108	60	34	7	1	6	3
Norfolk, Va.	70	43	19	3	1	4	8
Richmond, Va.	93	60	21	6	2	4	9
Savannah, Ga.	41	25	10	3	1	2	3
St. Petersburg, Fla.	135	115	11	3	5	1	6
Tampa, Fla.	90	48	26	6	6	4	10
Washington, D.C.	244	123	68	30	11	12	2
Wilmington, Del.	24	11	10	2	-	1	1
E.S. CENTRAL	876	537	215	51	26	47	53
Birmingham, Ala.	126	69	35	11	6	5	3
Chattanooga, Tenn.	61	47	8	5	-	1	6
Knoxville, Tenn.	87	61	17	5	2	2	1
Louisville, Ky.	127	75	37	7	-	8	12
Memphis, Tenn.	152	80	40	7	8	17	11
Mobile, Ala.	124	80	29	5	4	6	7
Montgomery, Ala.	52	36	10	3	2	1	-
Nashville, Tenn.	147	89	39	8	4	7	13
W.S. CENTRAL	1,723	1,028	397	159	67	72	87
Austin, Tex.	44	32	6	4	2	-	4
Baton Rouge, La.	72	51	12	3	3	3	-
Corpus Christi, Tex.	27	22	3	2	-	-	-
Dallas, Tex.	192	111	43	18	11	9	9
El Paso, Tex.	68	47	11	4	4	2	6
Fort Worth, Tex.	119	73	22	12	2	10	12
Houston, Tex.	602	302	156	79	31	34	15
Little Rock, Ark.	67	43	16	7	1	-	9
New Orleans, La.	162	104	40	9	5	4	-
San Antonio, Tex.	213	140	49	12	6	6	17
Shreveport, La.	46	23	18	3	-	2	5
Tulsa, Okla.	111	80	21	6	2	2	10
MOUNTAIN	656	446	128	37	21	24	37
Albuquerque, N.Mex.	93	63	17	6	5	2	13
Colo. Springs, Colo.	31	24	5	1	1	-	4
Denver, Colo.	123	89	19	8	3	4	8
Las Vegas, Nev.	73	39	26	2	2	4	2
Ogden, Utah	22	15	4	-	1	2	1
Phoenix, Ariz.	151	106	27	7	5	6	3
Pueblo, Colo.	20	13	4	3	-	-	-
Salt Lake City, Utah	43	25	13	2	1	2	-
Tucson, Ariz.	100	72	13	8	3	4	6
PACIFIC	2,077	1,420	400	130	53	72	108
Berkeley, Calif.	21	16	4	-	-	1	1
Fresno, Calif.	94	75	17	-	2	-	10
Glendale, Calif.	54	42	8	2	1	1	1
Honolulu, Hawaii	79	49	27	1	-	2	6
Long Beach, Calif.	95	62	20	10	1	2	5
Los Angeles, Calif.	661	453	127	46	18	17	10
Oakland, Calif.	101	68	20	9	2	2	7
Pasadena, Calif.	23	16	5	-	1	1	2
Portland, Oreg.	146	104	22	4	7	9	9
Sacramento, Calif.	75	50	14	6	1	4	3
San Diego, Calif.	161	106	30	15	4	6	14
San Francisco, Calif.	135	87	28	7	2	9	4
San Jose, Calif.	155	105	28	15	4	3	13
Seattle, Wash.	137	93	24	5	3	12	8
Spokane, Wash.	52	38	8	5	-	1	5
Tacoma, Wash.	88	56	18	5	7	2	10
TOTAL	13,257††	8,733	2,825	859	377	448	713

* 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 4 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

†† Total includes unknown ages.

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

VZIG for Prevention of Chickenpox – Continued

Pregnant Women: Pregnant women should be evaluated the same way as other adults. Some experts have recommended VZIG administration for pregnant women with negative or uncertain prior histories of varicella who are exposed in the first or second trimester to prevent congenital varicella syndrome or in the third trimester to prevent neonatal varicella. However, there is no evidence that administration of VZIG to a susceptible, pregnant woman will prevent viremia, fetal infection, or congenital varicella syndrome. Because most immunosuppressed persons who receive VZIG after a significant exposure develop modified clinical disease or subclinical infection, it is theoretically possible that VZIG may prevent or suppress clinical disease in the normal mother without preventing fetal infection and disease. In the absence of evidence that VZIG can prevent congenital varicella syndrome or neonatal varicella, the primary indication for VZIG in pregnant women is to prevent complications of varicella in a susceptible adult patient rather than to prevent intrauterine infection. Neonates born to mothers who develop varicella within the 5 days preceding or 48 hours after delivery should receive VZIG regardless of whether the mother received VZIG.

Hospital Settings

Personnel: After exposure, hospital personnel with negative or uncertain prior histories of chickenpox should be evaluated in the same manner as other adults. When deciding whether to give VZIG to exposed hospital personnel, types of exposure and histories of prior exposure to patients with varicella should be taken into account. If available, sensitive laboratory tests for determining susceptibility can be used to assess candidacy for VZIG and whether work restrictions are necessary during the incubation period.

Hospital Management of Varicella

Ideally, health-care personnel caring for patients with chickenpox or zoster should be immune to varicella. Proper control measures to prevent or control varicella outbreaks in hospitals should include strict isolation precautions,†† cohorting of exposed patients,§§ early discharge when possible, and the use of immune staff.¶¶ Potentially susceptible hospital personnel (Table 3) with significant exposure should not have direct patient contact from the 10th through the 21st day after exposure, if they do not develop varicella. This is the period during which chickenpox may occur. If they develop varicella, they should not have direct patient contact until all lesions have dried and crusted, generally 6 days after rash onset.***

In general, the same control measures should apply regardless of whether potentially susceptible personnel or patients receive VZIG. Data on clinical attack rates and incubation periods of varicella following VZIG administration to normal adults are lacking. Studies of immunocompromised children with negative histories of previous varicella treated with VZIG, who have had intense exposures, such as in the household setting, demonstrate that approximately one-third to one-half will develop clinical varicella and could be infectious. Many of the remaining susceptibles develop subclinical infections that theoretically may be infectious. In addition, VZIG may prolong the average incubation period in immunocompromised patients from 14 to 18 days. The vast majority of cases occur within 28 days of exposure in immunocompromised, VZIG-treated patients. Because of the potential of a prolonged incubation period, personnel who receive VZIG should probably not work in patient areas for 10-28 days following exposure if no illness occurs.

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††Whenever possible, patients should be in a negative-pressure room.

§§Exposed persons can share a room.

¶¶Most studies indicate that almost all adults with prior histories of varicella are immune. Thus, staff with positive histories should be considered immune. Serologic screening may be useful in defining immunity of staff with negative or uncertain histories.

***It should be remembered that staff with varicella may be contagious 1-2 days before onset of rash.

VZIG for Prevention of Chickenpox — Continued

USE

Administration

VZIG is of maximum benefit when administered as soon as possible after the presumed exposure but may be effective given as late as 96 hours after exposure. VZIG has not been evaluated more than 96 hours after initial exposure.

VZIG is not known to be useful in treating clinical varicella or zoster or in preventing disseminated zoster, and it is not recommended for such use. The duration of protection after VZIG administration is unknown, but it seems reasonable that protection should last for at least one half-life of immune globulin—approximately 3[†††] weeks. To be safe, high-risk susceptibles who are again exposed more than 3 weeks after a prior dose of VZIG should receive another full dose.

Dosage

VZIG is supplied in vials containing 125 units per vial (volume is approximately 1.25 cc). The recommended dose is 125 units per 10 kg (22 lbs) body weight, up to a maximum of 625 units (i.e., five vials). The minimum dose is 125 units. Fractional doses are not recommended. Some experts recommend 125 units per 10 kg of body weight without limiting the total dose to 625 units. VZIG has not been evaluated as a prophylactic measure for prevention or attenuation of varicella in normal or immunocompromised adults. Therefore, data do not exist with which to calculate the appropriate dose in adults. However, it seems likely that 625 units should be sufficient to prevent or modify infection in normal adults. Higher doses may be needed in immunocompromised adults.

Route

VZIG should be administered intramuscularly as directed by the manufacturer. IT SHOULD NEVER BE ADMINISTERED INTRAVENOUSLY.

Supply

VZIG is produced by the Massachusetts Public Health Biologic Laboratories. Outside Massachusetts, distribution is arranged by the American Red Cross Blood Services—Northeast Region, through other centers (Table 6). VZIG is distributed within Massachusetts by the Massachusetts Public Health Biologic Laboratories.

ADVERSE REACTIONS AND PRECAUTIONS

The most frequent adverse event following VZIG is local discomfort at the injection site. Pain, redness, or swelling occurs at the injection site in about 1% of patients. Less frequent adverse reactions are gastrointestinal symptoms, malaise, headache, rash, and respiratory symptoms that occur in approximately 0.2% of recipients. Severe reactions, such as angioneurotic edema and anaphylactic shock, are rare (less than 0.1%).

When VZIG is indicated for patients with severe thrombocytopenia or any other coagulation disorder that would ordinarily contraindicate intramuscular injections, the expected benefits should outweigh the risks.

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(See Bibliography on page 99.)

[†††] In the absence of increased loss or turnover of immunoglobulin (e.g., nephrotic syndrome or Wiskott-Aldrich syndrome).

VZIG for Prevention of Chickenpox — Continued

TABLE 6. Varicella-zoster immune globulin regional distribution centers

Service area	Regional center and 24-hour telephone
Massachusetts	Massachusetts Public Health Biologics Laboratories 305 South St. Jamaica Plain, MA 02130 (617) 522-3700
Maine	American Red Cross Blood Services Northeast Region 812 Huntington Ave. Boston, MA 02115 (617) 731-2130
or	American Red Cross Blood Services Northeast Region- Portland Location 524 Forest Ave. Portland, ME 04101 (207) 775-2367
Connecticut	American Red Cross Blood Services Connecticut Region 209 Farmington Ave. Farmington, CT 06032 (203) 678-2730
Vermont, New Hampshire	American Red Cross Blood Services Vermont-New Hampshire Region 32 N. Prospect St. Burlington, VT 05402 (802) 658-6400
Rhode Island	Rhode Island Blood Center 551 N. Main St. Providence, RI 02904 (401) 863-8368
New Jersey, New York	The Greater New York Blood Program 150 Amsterdam Ave. New York, NY 10023 (212) 570-3067 (212) 570-3068 (night)
New York	American Red Cross Blood Services Northeastern New York Region Hackett Blvd. at Clara Barton Dr. Albany, NY 12208 (518) 449-5020 (518) 462-7461 (518) 462-6964 (night)
or	American Red Cross Blood Services Greater Buffalo Chapter 786 Delaware Ave. Buffalo, NY 14209 (716) 886-7500
or	American Red Cross Blood Services Rochester Region 50 Prince St. Rochester, NY 14607 (716) 461-9800
or	American Red Cross Blood Services Syracuse Region 636 S. Warren St. Syracuse, NY 13202 (315) 425-1647
Delaware, Pennsylvania, Southern New Jersey	American Red Cross Blood Services Penn-Jersey Region 23rd and Chestnut Philadelphia, PA 19103 (215) 299-4110
Maryland	American Red Cross Blood Services Baltimore Region 2701 N. Charles St. Baltimore, MD 21218 (301) 467-9905
Virginia	American Red Cross Blood Services Tidewater Region 611 W. Brambleton Ave. P.O. Box 1836 Norfolk, VA 23501 (804) 446-7708
or	Richmond Metropolitan Blood Service 2201 Westwood Ave. Richmond, VA 23230 (804) 359-5100
Washington, D.C., Maryland, Virginia, West Virginia	American Red Cross Blood Services Washington Region 2025 E Street, N.W. Washington, DC 20006 (202) 728-6426
Georgia	American Red Cross Blood Services Atlanta Region 1925 Monroe Dr., N.E. Atlanta, GA 30324 (404) 881-9800 (404) 881-6752 (night)
North Carolina	American Red Cross Blood Services Carolinas Region 2425 Park Rd. Charlotte, NC 28236 (704) 376-1661

VZIG for Prevention of Chickenpox — Continued

TABLE 6. Varicella-zoster immune globulin regional distribution centers — *Continued*

Service area	Regional center and 24-hour telephone
South Carolina	American Red Cross Blood Services South Carolina Region 1100 Shirley St. Columbia, SC 29205 (803) 256-2301
Florida	South Florida Blood Service 1675 N.W. Ninth Ave. Miami, FL 33136 (305) 326-8888
or	American Red Cross Blood Services Mid-Florida Region 341 White St. Daytona Beach, FL 32014 (904) 255-5444
Alabama, Mississippi	American Red Cross Blood Services Alabama Region 2225 Third Ave., N. Birmingham, AL 35203 (205) 322-5661
Indiana	American Red Cross Blood Services Fort Wayne Region 1212 E. California Rd. Fort Wayne, IN 46825 (219) 482-3781
Michigan	American Red Cross Blood Services Southeastern Michigan Region 100 Mack Ave. P.O. Box 351 Detroit, MI 48232 (313) 494-2715
or	American Red Cross Blood Services Wolverine Region 202 E. Boulevard Dr. Flint, MI 48501 (313) 232-1176
or	American Red Cross Blood Services Great Lakes Region 1800 E. Grand River Lansing, MI 48912 (517) 484-7461
Ohio	American Red Cross Blood Services Northern Ohio Region 3950 Chester Ave. Cleveland, OH 44114 (216) 781-1800
or	American Red Cross Central Ohio Region 995 E. Broad St. Columbus, OH 43205 (614) 253-7981
Wisconsin, Iowa, North Dakota, South Dakota	The Blood Center of S.E. Wisconsin 1701 W. Wisconsin Ave. Milwaukee, WI 53233 (414) 933-5000
Wisconsin	American Red Cross Blood Services Badger Region 1202 Ann St. Madison, WI 53713 (608) 255-0021
Minnesota	American Red Cross Blood Services St. Paul Region 100 S. Robert St. St. Paul, MN 55107 (612) 291-6789 (612) 291-6767 (night)
Northern Illinois (Chicago)	American Red Cross Blood Services Mid-America Region 43 E. Ohio St. Chicago, IL 60611 (312) 440-2222
Arkansas, Kansas, Kentucky, Missouri, Southern Illinois	American Red Cross Blood Services Missouri-Illinois Region 4050 Lindell Blvd. St. Louis, MO 63108 (314) 658-2000 (314) 658-2136 (night)
Nebraska	American Red Cross Blood Services Midwest Region 3838 Dewey Ave. Omaha, NE 68105 (402) 341-2723
Tennessee	American Red Cross Blood Services Nashville Region 321 22nd Ave., N. Nashville, TN 37203 (615) 327-1931, ext. 315
Louisiana, Oklahoma, Texas	Gulf Coast Regional Blood Center 1400 La Concha Houston, TX 77054-1802 (713) 791-6250

VZIG for Prevention of Chickenpox — Continued

TABLE 6. Varicella-zoster immune globulin regional distribution centers — *Continued*

Service area	Regional center and 24-hour telephone
or	American Red Cross Blood Services Central Texas Region McLennan County Chapter 4224 Cobbs Dr. Waxo, TX 76710 (817) 776-8754
or	American Red Cross Blood Services Red River Region 1809 Fifth St. Wichita Falls, TX 76301 (817) 322-8686
Colorado, New Mexico	United Blood Services 1515 University Blvd., N.E. P.O. Box 25445 Albuquerque, NM 87125 (505) 247-9831
Arizona	American Red Cross Blood Services Southern Arizona Region 222 South Cherry Ave. Tucson, AZ 85719 (602) 623-0541
Hawaii, Southern California	American Red Cross Blood Services L.A.-Orange Counties Region 1130 S. Vermont Ave. Los Angeles, CA 90006 (213) 739-5200
Nevada, Utah, Wyoming, Northern California	American Red Cross Blood Services Central California Region 333 McKendrie St. San Jose, CA 95110 (408) 292-1626
Alaska, Montana, Oregon	American Red Cross Blood Services Pacific Northwest Region 4200 S.W. Corbett St. Portland, OR 97201 (503) 243-5286
Idaho	American Red Cross Blood Services Snake River Region 5380 Franklin St. Boise, ID 83705 (208) 342-4500
Washington	Puget Sound Blood Center Terry at Madison Seattle, WA 98104 (206) 292-6525
Canada	Canadian Red Cross Blood Transfusion Service National Office 95 Wellesley St. E. Toronto, Ontario M4Y1H6 (416) 923-6692
Puerto Rico	American Red Cross Servicio de Sangre Capitulo GPO Box 6046 San Juan, PR 00936 (809) 759-7979
Central and South America	South Florida Community Blood Center 1675 N.W. Ninth Ave. Miami, FL 33142 (305) 326-8888
All other countries	American Red Cross Blood Services Northeast Region 60 Kendrick St. Needham, MA 02194 (617) 449-0773
or	American Red Cross Blood Services 812 Huntington Avenue Boston, MA 02115 (617) 731-2130

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VZIG for Prevention of Chickenpox — Continued

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Current Trends

Update: Respiratory Virus Surveillance — United States, 1984

Reports of noninfluenza respiratory viruses identified by certain state and university laboratories and received by CDC through February 14, 1984, show that respiratory syncytial virus (RSV) has now been reported from all regions of the United States since December 1983 (Table 7). The rate of RSV identification remains high in most regions. The Mountain region reported the largest number of RSV identifications; 200 of 597 respiratory specimens tested during January and February were positive for RSV. No RSV isolates were reported in January or February in the East South Central region. With the addition of data from several university laboratories in the East North Central and West North Central regions, it appears that RSV was present in these regions in December, as it was in the rest of the United States.

Reported by LL Minnich, MS, CG Ray, MD, Arizona Health Science Center, Tucson; B Lauer, MD, M Levin, MD, University of Colorado Health Sciences Center, Denver; C Brandt, PhD, HW Kim, MD, Children's

TABLE 7. Respiratory syncytial virus isolates — United States, November 1983-February 1984

	New England	Mid-Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
November 1983	3	0	0	1	14	3	6	7	2
December 1983	10	21	14	13	55	6	15	41	9
January 1984	71	21	57	40	37	0	16	149	12
February 1984*	55	†	51	15	11	0	†	51	†
Total	**139**	**42**	**122**	**69**	**117**	**9**	**37**	**248**	**23**

*Includes isolates identified through February 14, 1984.

†February 1984 data pending.

Respiratory Virus Surveillance — Continued

Hospital National Medical Center, District of Columbia; L Pierik, K McIntosh, MD, The Children's Hospital, Boston, Massachusetts; T O'Leary, MPH, TC Shope, MD, University of Michigan Medical Center, Ann Arbor; HH Balfour, MD, University of Minnesota Hospitals, Minneapolis; GA Storch, MD, St. Louis Children's Hospital, Missouri; ME Kumar, MD, Cleveland Metropolitan General Hospital, Ohio; P Swenson, PhD, North Shore University Hospital, Manhasset, CB Hall, MD, University of Rochester Medical Center, Rochester, New York; H Friedman, MD, S Plotkin, MD, The Children's Hospital of Philadelphia, Pennsylvania; M Kervina, MS, E Sannella, MS, PF Wright, MD, Vanderbilt University School of Medicine, Nashville, Tennessee; L Corey, MD, Children's Orthopedic Hospital, Seattle, Washington; Respective State Virus Laboratory Directors; Div of Viral Diseases, Center for Infectious Diseases, CDC.

Editorial Note: The respiratory virus surveillance system demonstrates temporal and geographic patterns of noninfluenza respiratory viruses identified in the United States. These data indicate which viruses are circulating in a community but do not measure rates of illness or morbidity or mortality. Variability in the number of specimens tested, source and methods of specimen collection, and isolation and identification methods make it impossible to compare data among regions. Surveillance has demonstrated a nationwide occurrence of RSV this season, with onset at approximately the same time in all regions of the country. The reason for the absence of reported RSV in the East South Central region, despite its presence in all other regions in January and February, is unclear.

Chronic Inhalation Exposure to Coal Dust and/or Diesel Exhaust: Effects on the Alveolar Macrophages of Rats

The use of diesel-powered equipment in underground mines has raised questions regarding possible toxic interactions between coal dust and diesel emissions. The National Institute for Occupational Safety and Health (NIOSH) has studied in rats the effects of coal dust, alone and in combination with diesel engine exhausts, on physiologic properties of the alveolar macrophages (the pulmonary cell that provides the first line of defense against inhaled particulates) (*1*). These pneumocytes were obtained after the animals were subjected to chronic exposure to aerosols containing coal dust and/or diesel exhausts.

The rats were exposed by inhalation for 7 hours a day, 5 days a week, for 2 years. In addition to a control group (exposed only to filtered air), groups of rats were exposed to atmospheres containing 2 mg/m^3 coal dust, 2 mg/m^3 diesel particulates, or 1 mg/m^3 coal dust plus 1 mg/m^3 diesel particulates. At the end of exposure, alveolar macrophages were obtained at necropsy by lavage of the rat lungs with phosphate-buffered saline, pH = 7.4 (*2*).

The following physiologic parameters of these cells were measured: (1) membrane integrity, as indicated by maintenance of a constant cell volume and absence of protein and lysosomal enzymes in acellular fluid from the pulmonary lavage; (2) viability, as indicated by lack of affect on cellular protein content, cellular lysosomal enzyme activity, or oxygen consumption; (3) metabolic activity, i.e., enhanced secretion of reactive forms of oxygen (e.g., superoxide, hydrogen peroxide, and hydroxyl radical); and (4) morphologic changes indicating phagocytic activity, such as "spreading" of the cell and "ruffling" of its surface, as observed by scanning electron microscopy.

The results of these tests suggested that chronic exposure to coal dust and/or diesel exhaust did not alter the membrane integrity of the alveolar macrophages. However, exposure to coal dust activates alveolar macrophages, while diesel exhaust depresses them. In other words, exposure to coal dust *in situ* increased the number of macrophages obtained by lavage, enhanced the secretion of reactive forms of oxygen, and increased cellular spreading. In contrast, exposure to diesel-engine exhausts resulted in decreased secretion of reactive

Chronic Inhalation Exposure — Continued

forms of oxygen and less formation of surface ruffling. The combination of coal dust and diesel-engine exhausts resulted in degrees of secretory activity and surface morphology intermediate between the effects of separate exposures.

Reported by Div of Respiratory Disease Studies, NIOSH, CDC.

Editorial Note: The data reported here may have implications for understanding the development of emphysema in coal miners, i.e., hypersecretion of reactive forms of oxygen may act to destroy pulmonary tissue. Furthermore, exposure to diesel-engine exhaust may adversely affect the lungs by decreasing the phagocytic capacity of alveolar macrophages. These laboratory investigations point up the complexity of predicting the pulmonary response to combined exposures, thus emphasizing the need for careful epidemiologic investigations of workers exposed to combined coal-diesel emissions.

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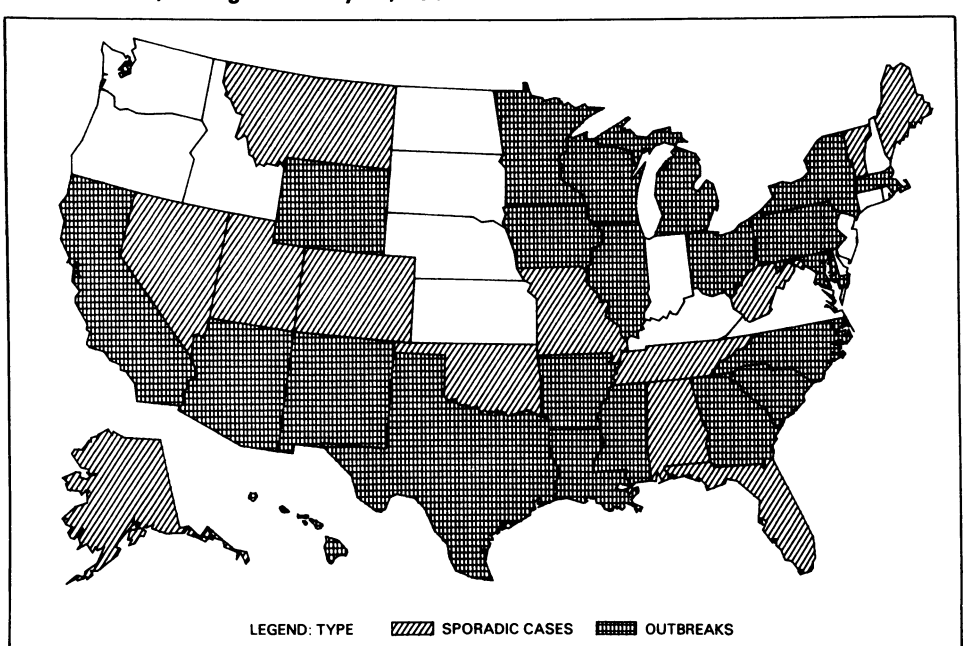
Update: Influenza Activity — United States

Outbreaks of influenza, noted primarily in schools and colleges, continued to be reported from all regions of the United States. From February 10 to February 17, Maryland, Ohio, Tennessee, and Utah reported their first influenza type A(H1N1) isolates for the 1983-1984

FIGURE 2. States with outbreaks or sporadic cases of influenza type A(H1N1) virus — United States, through February 17, 1984*



*Includes outbreaks where virus types A(H1N1) and B were both isolated.

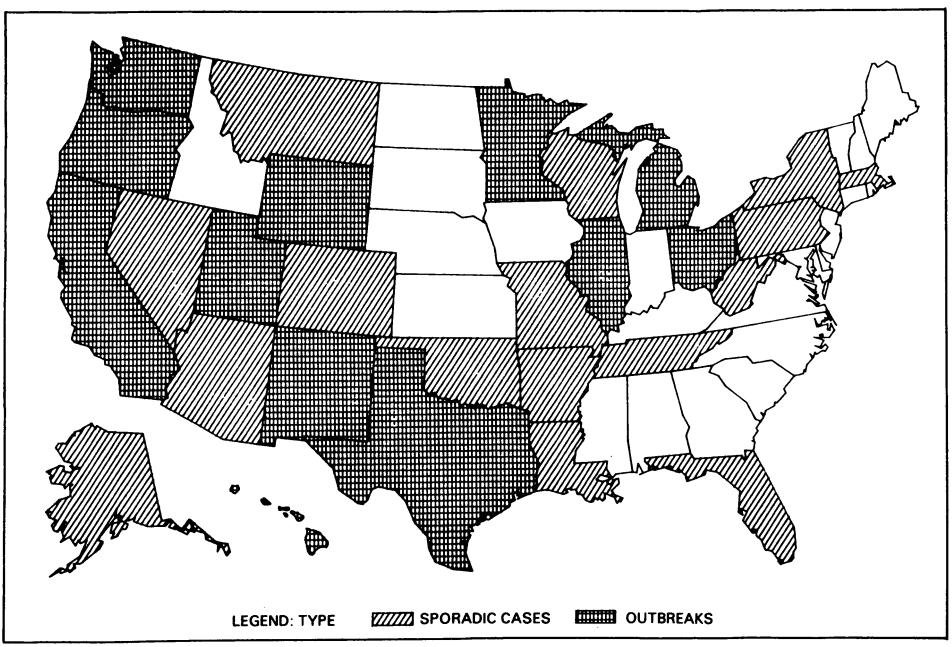
Influenza — Continued

season, while Arkansas, Florida, Louisiana, Massachusetts, Michigan, Missouri, Ohio, and Pennsylvania reported their first type B isolates. Influenza type A(H1N1) virus has now been isolated in 35 states (Figure 2) and type B virus, in 28 states (Figure 3).

In the northwest, only type B virus has been isolated from influenza outbreaks in Oregon and Washington. In contrast, only type A(H1N1) virus has been isolated this season in several southeastern states, where widespread outbreaks have occurred (Alabama, Georgia, Mississippi, North Carolina, and South Carolina). Between these geographic foci, both influenza types A(H1N1) and B have been isolated, sometimes during the same outbreak. Influenza outbreaks have been only rarely documented in institutions with older residents, such as nursing homes, this season.

Reported by State Epidemiologists and Laboratory Directors; Statistical Svcs Br, Div of Surveillance and Epidemiologic Studies, Epidemiology Program Office, Statistical Svcs Activity, Influenza Br, Div of Viral Diseases, Center for Infectious Diseases, CDC.

FIGURE 3. States with outbreaks or sporadic cases of influenza type B virus — United States, through February 17, 1984*



*Includes outbreaks where virus types A(H1N1) and B were both isolated.

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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.

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

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