

# M M W R

## MORBIDITY AND MORTALITY WEEKLY REPORT

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Recommendation of the Public Health Service  
Advisory Committee on Immunization Practices

### Immune Globulins for Protection Against Viral Hepatitis

#### INTRODUCTION

The term "viral hepatitis," as commonly used, applies to at least 3 clinically similar disease entities that are distinct in their virology, immunology, and epidemiology. Two of these diseases, hepatitis A (formerly "infectious hepatitis") and hepatitis B (formerly "serum hepatitis"), have been recognized as separate entities since the early 1940s and account for most cases of viral hepatitis. The third one, "other hepatitis viruses" (non-A, non-B viral hepatitis), has only recently been identified as a separate entity and is a diagnosis of exclusion once hepatitis A and B have been ruled out by appropriate diagnostic tests. This diagnosis appears to encompass the majority of post-transfusion hepatitis cases in the United States today.

Immune serum globulin (ISG)\* offers effective protection against the clinical manifestations of hepatitis A. Recent evidence also suggests that immune globulin preparations containing varying quantities of specific antibody against hepatitis B (anti-HBs) may be partially effective against this disease as well. At the present time there is no evidence to suggest immune globulins are effective against non-A, non-B hepatitis. Clinically, it is extremely difficult to distinguish between individual cases of viral hepatitis. Classification is therefore dependent upon careful evaluation of epidemiologic evidence and the use of appropriate serologic tests.

#### Hepatitis A

Hepatitis A is caused by infection with hepatitis A virus (HAV), a small 27-nm virus that has not yet been fully characterized. Illness produced by HAV infection is characteristically of abrupt onset, with fever, malaise, anorexia, nausea, abdominal discomfort, and jaundice. Morbidity is age-related, with asymptomatic infection and anicteric illness predominating in childhood. Mortality in clinical cases is quite low (less than 1%). Transmission occurs primarily by the fecal-oral route under conditions of poor sanitation and close contact between infected persons, although

common-source exposures via contaminated food and water do occur. The incubation period of hepatitis A is 15-45 days (average 25-30 days). HAV has consistently been demonstrated in the stools of infected persons, with peak viral excretion occurring during the late incubation and early prodromal phase of illness. Viral excretion falls off rapidly with the onset of jaundice. The period of maximal infectivity occurs during the 2-week period before the onset of jaundice. Viremia is of short duration, and a chronic blood carrier state for HAV has not been demonstrated. HAV is not a significant cause of post-transfusion hepatitis.

Serum antibody against HAV (anti-HAV) has recently been demonstrated by radioimmune assay, immune adherence hemagglutination, and complement-fixation techniques. Antibody remains detectable in serum for years and apparently confers life-long immunity to reinfection. Preliminary sero-epidemiologic studies have documented that hepatitis A is a common infection in the United States with over half the population having serologic evidence of past infection by mid-adult life.

#### Hepatitis B

Hepatitis B is caused by the hepatitis B virus (HBV), a 42-nm, double-shelled virus originally known as the "Dane particle." Two well defined antigen-antibody systems have been associated with the HBV virion. Hepatitis B surface antigen (HBsAg), formerly known as the "Australia antigen," is the antigen found on the surface of the virus and on the accompanying 22-nm spherical and tubular forms. Various subtypes of HBsAg have been described and have proven to be useful epidemiologic markers of infection.

Hepatitis B core antigen (HBcAg) is the antigen found within the core of the virus, and HBV specific DNA polymerase and circular double-stranded DNA have been associated with it. HBsAg can be identified in the serum 1-2 months after exposure and may persist for a variable period. The frequency of the chronic carrier state for HBsAg is variable but appears to be related both to the age at which infection is acquired and to the immunologic competence of the host. It has been estimated that as many as 10% of HBV infections result in chronic carriage of HBsAg. The carrier state can be completely asymptomatic, or, less commonly, it may be associated with active liver disease.

\*See section, "Immune Globulins." The class of serum proteins of which ISG is an example are called immunoglobulins or immune globulins.

## Viral Hepatitis — Continued

While the carrier state appears to be important in perpetuating transmission of hepatitis B in a given population, recent evidence suggests that HBsAg carriers possess varying degrees of infectivity.

A newly described antigen-antibody system, the "e" system, appears to be of value in identifying those HBV carriers who are most likely to develop active liver disease and to be efficient disseminators of infection. The presence of HBeAg in the serum appears to be a marker for degree of infectivity and has been associated with active forms of chronic liver disease and with a poor prognosis for the chronic HBsAg carrier.

Several routes of exposure to HBV have been documented. Based on available data, the principle modes of transmission include:

1. direct percutaneous inoculation by needle of contaminated serum or plasma or transfusion of infected blood or blood products;
2. non-needle, percutaneous transfer of infected serum or plasma such as may occur through minute skin cuts or abrasions;
3. introduction of infective serum or plasma on mucosal surfaces such as may occur through inadvertent introduction of this material into buccal or ocular surfaces;

4. introduction of other known infective secretions such as saliva or semen into mucosal surfaces as through sexual contact; and

5. indirect transfer of serum or plasma via vectors or inanimate environmental surfaces.

Experimental data suggest that airborne transmission of infection is not important in virus transfer and that transmission of infection via an intestinal route does not occur.

The onset of hepatitis B is generally insidious and consists of a variable combination of the following: anorexia, malaise, nausea, vomiting, abdominal pains, jaundice, as well as arthralgias and arthritis. Morbidity and mortality are variable and may be a function of HBV dose and the age of the patient. Older individuals typically have higher mortality. The incubation period of hepatitis B is characteristically long, ranging from 60-180 days (average 90 days).

## HEPATITIS SURVEILLANCE

Viral hepatitis has been a nationally reportable disease since 1952. In 1966 the reporting system was changed to permit classification of cases into 2 categories: 1) hepatitis A and hepatitis unspecified and 2) hepatitis B. Since 1974 hepatitis A and hepatitis unspecified have been reported separately. From 1952 to 1966, the annual number of reported viral hepatitis cases has varied. The lowest number of reported cases occurred in 1957 (14,922), flanked by major peaks in 1954 and 1961. After the 1961 peak

Table I. Summary—Cases of Specified Notifiable Diseases: United States

(Cumulative totals include revised and delayed reports through previous weeks)

| DISEASE                                     | 51st WEEK ENDING     |                      | MEDIAN<br>1972-1976 | CUMULATIVE, FIRST 51 WEEKS |                      |                     |
|---|----------------------|----------------------|---------------------|----------------------------|----------------------|---------------------|
|   | December 24,<br>1977 | December 25,<br>1976 |                     | December 24,<br>1977       | December 25,<br>1976 | MEDIAN<br>1972-1976 |
| Aseptic meningitis                          | 42                   | 66                   | 59                  | 4,462                      | 3,186                | 4,058               |
| Brucellosis                                 | 4                    | —                    | 2                   | 214                        | 278                  | 188                 |
| Chickenpox                                  | 2,864                | 3,587                | —                   | 179,544                    | 178,700              | —                   |
| Diphtheria                                  | —                    | —                    | 1                   | 81                         | 146                  | 207                 |
| Encephalitis                                | Primary              | 11                   | 17                  | 1,388                      | 1,376                | 1,376               |
|   | Post-Infectious      | 3                    | 1                   | 202                        | 257                  | 267                 |
| Hepatitis, Viral                            | Type B               | 222                  | 270                 | 15,874                     | 14,663               | 9,782               |
|   | Type A               | 442                  | 566                 | 30,071                     | 32,716               | 40,008              |
|   | Type unspecified     | 109                  | 156                 | 8,936                      | 7,912                | —                   |
| Malaria                                     | 12                   | 5                    | 5                   | 513                        | 449                  | 413                 |
| Measles (rubeola)                           | 205                  | 716                  | 369                 | 54,596                     | 39,388               | 26,476              |
| Meningococcal infections, total             | Civilian             | 35                   | 34                  | 1,728                      | 1,507                | 1,336               |
|   | Military             | —                    | —                   | —                          | —                    | —                   |
| Mumps                                       | 335                  | 493                  | 1,338               | 19,824                     | 37,771               | 57,413              |
| Pertussis                                   | 61                   | 9                    | —                   | 1,890                      | 906                  | —                   |
| Rubella (German measles)                    | 137                  | 134                  | 134                 | 19,924                     | 12,051               | 16,096              |
| Tetanus                                     | 1                    | 3                    | 2                   | 70                         | 69                   | 93                  |
| Tuberculosis                                | 473                  | 440                  | —                   | 29,458                     | 31,868               | —                   |
| Tularemia                                   | 4                    | 4                    | 3                   | 159                        | 137                  | 138                 |
| Typhoid fever                               | 5                    | 4                    | 6                   | 373                        | 392                  | 392                 |
| Typhus, tick-borne (Rky. Mt. spotted fever) | 6                    | 2                    | 6                   | 1,111                      | 892                  | 775                 |
| Venereal Diseases:                          |                      |                      |                     |                            |                      |                     |
| Gonorrhea                                   | Civilian             | 15,321               | 16,479              | —                          | 979,849              | 986,583             |
|   | Military             | 331                  | 410                 | —                          | 26,003               | 28,491              |
| Syphilis, primary and secondary             | Civilian             | 342                  | 389                 | —                          | 20,131               | 23,381              |
|   | Military             | 9                    | 6                   | —                          | 302                  | 335                 |
| Rabies in animals                           | 17                   | 29                   | 36                  | 2,914                      | 2,861                | 2,861               |

Table II. Notifiable Diseases of Low Frequency: United States

|                               | CUM. |                               | CUM. |
|-------------------------------|------|-------------------------------|------|
| Anthrax:                      | —    | Poliomyelitis, total:         | 20   |
| Botulism:                     | 103  | Paralytic: Tex. 1             | 17   |
| Congenital rubella syndrome:* | 16   | Psittacosis: Md. 3            | 65   |
| Leprosy:                      | 131  | Rabies in man:                | 1    |
| Leptospirosis: Pa. 1, Tex. 1  | 50   | Trichinosis: Mass. 1, Va. 2   | 113  |
| Plague:                       | 17   | Typhus, murine: Va. 1, Tex. 1 | 72   |

\*The following delayed report will be reflected in next week's issue: Cong. rubella syndrome: N.H. 1

*Viral Hepatitis – Continued*

(72,651), a decrease in reported cases occurred until the most recent low was reached in 1966 (34,356).

For the period of separate reporting (1966-present), the incidence of hepatitis A peaked in 1971 (59,606) and has been declining since. For the 3 years for which figures are available for hepatitis unspecified, the rate has remained nearly constant. The incidence of hepatitis B has continued to rise during the period of separate reporting. In 1966 there were 1,497 reported cases of hepatitis B (1.8 cases per 100,000 population), and in 1976 there were 14,850 cases (6.9 cases per 100,000 population). This represents a 10-fold increase in the number of reported cases and an almost 4-fold increase in case rate.

Currently, the age group most vulnerable to viral hepatitis is young adults (20-24 years), followed by the 15- to 19 and the 25- to 29-year-olds. For hepatitis A, there is a preceding but smaller peak in incidence in the 5- to 9-year olds. For hepatitis B immediately evident are the lack of cases in persons less than 15 years old. All reported hepatitis cases show an overall case-fatality rate of approximately 1.0%, a rate which increases with increasing age. The case-fatality rate appears to be similar for hepatitis A and B. Since 1966, surveillance has revealed that the seasonal variation for viral hepatitis has diminished remarkably.

**IMMUNE GLOBULINS**

Immune globulins are sterile solutions for intramuscular use containing antibody derived from human blood. They are 16.5% protein obtained by cold ethanol fractionation of large pools of blood plasma. ISG, one of the immune globulins, contains specified amounts of antibody against diphtheria, measles, and one type of poliovirus and varying amounts of antibody against hepatitis A and hepatitis B, depending on the preparation. Neither hepatitis A nor hepatitis B has been transmitted by immune globulins.

**ISG AND HEPATITIS A**

Numerous field studies during the past 2 decades have documented the protection against hepatitis A conferred by ISG administered before exposure and during the incubation period. Its relative effectiveness depends on timing and dose. When administered before or within 1-2 weeks after exposure to hepatitis A in the appropriate dose, it prevents illness in 80-90% of those exposed. Also, because ISG may not suppress inapparent infection, long-lasting, natural immunity may result.

The decision to give ISG is based on assessing the possible hepatitis exposure. If the exposure could have resulted in infection, ISG should be given.

ISG should be given as soon as possible after a known exposure. Its prophylactic value is greatest when given early in the incubation period and decreases with time after exposure. The use of ISG more than 2 weeks after exposure or after onset of clinical illness is not indicated.

**Dosage**

The dosage patterns of ISG in common use have been derived primarily from field and clinical observations. The dose of ISG may vary with the setting in which it is used. In postexposure prophylaxis a dose of 0.02 ml per kilogram of body weight is recommended. In pre-exposure settings, the dosage varies not only with body weight but also with the length of time protection is needed. Specific dosages in specific settings are given below.

**Postexposure Prophylaxis**

**Close personal contact:** Close personal contact, as among permanent and even temporary household residents, is important in the spread of hepatitis A. Secondary attack rates are particularly high for children and teenagers. Rates are somewhat lower for adults, but illness tends to be more severe. ISG is recommended for all household contacts who have not already had hepatitis A.

**School contacts:** Although there is a high incidence of hepatitis A among school-age children, contact at school is usually not an important means of transmitting this disease. Routine administration of ISG is not indicated for pupil or teacher contacts of a patient. However, when epidemiologic study has clearly shown that a school- or classroom-centered outbreak exists, it is reasonable to administer ISG to persons at risk.

**Institutional contacts:** The conditions in institutions, such as prisons and facilities for the mentally retarded, favor transmission of hepatitis A. While sporadic cases do occur, periodic epidemics of disease are generally most common. The administration of ISG to residents and staff contacts of hepatitis A cases may effectively limit the spread of disease.

**Hospital contacts:** Routine prophylactic administration of ISG to hospital personnel is not indicated. Emphasis should be placed on sound hygienic practices. Intensive, continuing education programs that point out the risk of exposure to hepatitis A as well as recommended precautions should be directed toward hospital personnel who have close contact with patients or infective materials.

**Office and factory exposure:** Routine administration of ISG is not indicated for persons exposed in the usual office or factory situation to a fellow worker with hepatitis.

**Common-source exposure:** When food, water, or other such vehicle is clearly identified as a common source of infection for multiple hepatitis cases, administration of ISG to others exposed to the same source theoretically could be expected to offer some degree of protection. In actual practice, however, the administration of ISG in this setting has not been shown to confer benefit. The apparent lack of efficacy of ISG appears to result from inherent delays in outbreak recognition with administration of ISG too late in the incubation period to significantly alter clinical manifestations of illness. Therefore, the use of ISG in this setting cannot be routinely recommended.

**Pre-exposure Prophylaxis**

**Exposure to non-human primates:** Sporadic cases and outbreaks of hepatitis have occurred among persons in close contact with recently imported non-human primates, primarily chimpanzees. Because of the similarity between chimpanzee-associated hepatitis and hepatitis A, prophylactic ISG has been used with apparent success in doses of 0.05 ml/kg of body weight administered every 4 months to those in close contact with newly imported animals. Emphasis should also be placed on other measures, such as scrupulous hygienic practices, use of protective clothing, and limited human contact with the animals.

**Travelers to foreign countries:** The risk of hepatitis A for U.S. residents traveling abroad appears to be small. It varies with living conditions, the prevalence of hepatitis in the areas visited, and particularly the length of stay.

### *Viral Hepatitis – Continued*

Travelers may be at no greater risk than in the United States when their travel involves ordinary tourist routes and lasts less than 3 months. ISG is not routinely recommended in such instances. However, travelers to tropical areas and developing countries who bypass ordinary tourist routes may be at greater risk of acquiring hepatitis A. If ISG is administered, the dosage should be 0.02 ml/kg of body weight.

Travelers planning to stay 3 or more months in tropical areas or developing countries where hepatitis A is common and where they may be exposed to infected persons and contaminated food and water are at greater risk of acquiring hepatitis. A single injection of ISG in a dose of 0.05 ml/kg of body weight is recommended for them.

For persons residing abroad in tropical areas or developing countries, the risk of hepatitis appears to persist. Experience has shown that regular administration of ISG offers at least partial protection against hepatitis. It is recommended that prophylactic ISG be repeated every 4-6 months at doses of 0.05 ml/kg of body weight.

### **IMMUNE GLOBULINS AND HEPATITIS B**

Early attempts to use ISG in the passive prophylaxis of viral hepatitis revealed this material to be of little or no benefit in the prevention of post-transfusion hepatitis. Based on early findings, passive immunization against hepatitis B was not generally recommended. The majority of initial studies were, however, conducted before the discovery of HBsAg and the development of serologic procedures for detection of the variety of immunologic markers currently associated with HBV infection. Thus, in early post-transfusion study settings, the dose of presumed HBV inoculum was high, hepatitis B and non-B cases could not be accurately distinguished, and specific anti-HBs content of utilized immune globulin preparations could not be assessed.

In the United States over half of the lots of ISG manufactured before 1972 contained no detectable anti-HBs, and, therefore, could not be presumed to be of any value in the prevention of hepatitis B. In contrast, most ISG manufactured subsequent to 1972 has contained detectable anti-HBs for which some specific effectiveness in passive prophylaxis might be inferred. The development of serologic tests enabling accurate diagnosis of hepatitis B and measurement of the specific anti-HBs content of immune globulins has resulted in re-evaluation of passive prophylaxis for this disease.

Unified interpretation of results of recent immune globulin prophylaxis studies has been rendered difficult by: 1) the use of immune globulin preparations of differing anti-HBs titers from a variety of manufacturers; 2) differences in dosage and timing of immune globulin administration; and 3) defects in design of some studies, the most important of which has been failure to include placebo controls.

In regard to anti-HBs titers of immune globulins, those of high anti-HBs titer (generally greater than 1:100,000 by passive hemagglutination [PHA]) prepared from donor pools preselected for anti-HBs content are now generally designated as hepatitis B immune globulin (HBIG). Such material was compared, in several studies, with globulins of lower or no detectable anti-HBs content. In general, such

latter globulins have been prepared from donor pools not initially preselected for anti-HBs content. It is important to note that the term HBIG refers to quantity of anti-HBs and not to its presence or absence in the manufactured product. Thus, ISG may be expected to contain some anti-HBs – in the United States, this would generally have a titer >1:64 by PHA.

Studies of passive immunization may be temporally divided into 2 categories, pre-exposure prophylaxis and post-exposure prophylaxis. An early randomized comparison of ISG containing a moderate titer of anti-HBs with true placebo among military personnel in a hepatitis B endemic area provided evidence that this globulin provided significant protection against disease in a pre-exposure prophylactic setting where hepatitis B was presumably transmitted by close personal contact.

In a study in a custodial institution of children who were experimentally inoculated with HBV, HBIG was found to have significantly greater protective effect in preventing ensuing hepatitis B than ISG with a low titer of anti-HBs when administered 4 hours after inoculation of virus. In this postexposure prophylactic setting, maximum effectiveness achieved for HBIG was 70%. The incubation period was significantly prolonged when hepatitis B did occur in the group given HBIG (mean of 188 days in comparison to 48 days in the group given ISG). Also, the low titer globulin appeared to be partially effective when compared to untreated controls.

It was against the background of evidence suggesting some effectiveness of ISG, but perhaps greater efficacy of HBIG, that subsequent trials of passive immunization against hepatitis B were undertaken. While none of these trials incorporated a true placebo control, they may be divided into 2 categories based on type of comparison groups used: those that incorporated ISG containing no detectable anti-HBs (placebo globulin) and those that compared the efficacy of HBIG to globulins with low to intermediate anti-HBs titers.

When compared to placebo globulin, HBIG has been found to be of significant value in pre-exposure prophylaxis of patients in hemodialysis units where hepatitis B is endemic and in postexposure prophylaxis of medical personnel following HBsAg-positive needle sticks, of spouse contacts of acute hepatitis B cases, and of infants born to HBsAg-positive mothers.

Results are less clear in studies which have compared the relative efficacy of HBIG with ISG that has low titers of anti-HBs. In a pre-exposure prophylactic study of new admissions to 3 institutions for the mentally retarded, HBIG and low anti-HBs titered immune globulins appeared to be equally effective in preventing hepatitis B when compared to an untreated control group. Furthermore, there was some evidence that individuals receiving low titered immune globulin may have developed active anti-HBs response in the absence of disease (passive-active immunity). In 2 large multicenter studies, the first involving pre-exposure prophylaxis of dialysis patients and staff, and the second, post-exposure prophylaxis of medical personnel exposed to HBsAg-positive needle sticks, the effectiveness of HBIG was compared to immune globulins of low and intermediate anti-HBs titer.

When the results of these studies were compared after 6 and 8 months of follow-up, a significant relative reduction

*(Continued on page 441)*

**Table III**  
**Cases of Specified Notifiable Diseases: United States**  
*Weeks Ending December 24, 1977 and December 25, 1976 - 51st Week*

| AREA REPORTING          | ASEPTIC<br>MENIN-<br>GITIS | BRUCEL-<br>LOSIS | CHICKEN-<br>POX | DIPHTHERIA |    | ENCEPHALITIS                                 |      |                      | HEPATITIS, VIRAL |        |                     | MALARIA |     |
|-------------------------|----------------------------|------------------|-----------------|------------|----|--|------|----------------------|------------------|--------|---------------------|---------|-----|
|                         |                            |                  |                 |            |    | Primary: Arthropod-<br>borne and Unspecified |      | Post In-<br>fectious | Type B           | Type A | Type<br>Unspecified |         |     |
|                         |                            |                  |                 |            |    | 1977   | 1976 | 1977                 | 1977             | 1977   | 1977                |         |     |
| UNITED STATES .....     | 42                         | 4                | 2,864           | -          | 81 | 11   | 17   | 3                    | 222              | 442    | 109                 | 12      | 513 |
| NEW ENGLAND .....       | -                          | -                | 211             | -          | -  | 1  | -    | -                    | 8                | 11     | 6                   | -       | 26  |
| Maine .....             | -                          | -                | 36              | -          | -  | -  | -    | -                    | -                | -      | -                   | -       | 1   |
| New Hampshire .....     | -                          | -                | 1               | -          | -  | -  | -    | -                    | -                | 2      | -                   | -       | 3   |
| Vermont .....           | NA                         | NA               | NA              | NA         | NA | NA   | -    | -                    | -                | NA     | NA                  | NA      | 2   |
| Massachusetts .....     | -                          | -                | 118             | -          | -  | 1  | -    | -                    | -                | 2      | 2                   | -       | 4   |
| Rhode Island .....      | -                          | -                | 23              | -          | -  | -  | -    | -                    | -                | -      | -                   | -       | 5   |
| Connecticut .....       | -                          | -                | 33              | -          | -  | -  | -    | -                    | 8                | 7      | 4                   | -       | 11  |
| MIDDLE ATLANTIC .....   | 9                          | 1                | 243             | -          | 5  | 2  | 2    | -                    | 54               | 67     | 25                  | 6       | 130 |
| Upstate New York .....  | 2                          | -                | 113             | -          | -  | -  | -    | -                    | 14               | 19     | 10                  | 4       | 28  |
| New York City .....     | 4                          | -                | 26              | -          | 5  | 1  | -    | -                    | 10               | 10     | 1                   | -       | 61  |
| New Jersey .....        | -                          | 1                | NN              | -          | -  | -  | 1    | -                    | 16               | 21     | 11                  | -       | 19  |
| Pennsylvania* .....     | 3                          | -                | 104             | -          | -  | 1  | 1    | -                    | 14               | 17     | 3                   | 2       | 22  |
| EAST NORTH CENTRAL ..   | 8                          | 1                | 1,412           | -          | -  | 3  | 1    | 1                    | 51               | 90     | 14                  | 1       | 38  |
| Ohio .....              | 1                          | -                | 173             | -          | -  | -  | -    | 1                    | 10               | 21     | -                   | 1       | 14  |
| Indiana .....           | -                          | -                | -               | -          | -  | -  | -    | -                    | -                | -      | -                   | -       | 2   |
| Illinois .....          | -                          | 1                | 267             | -          | -  | 1  | -    | -                    | 11               | 23     | 4                   | -       | 2   |
| Michigan .....          | 7                          | -                | 751             | -          | -  | 2  | 1    | -                    | 26               | 36     | 9                   | -       | 17  |
| Wisconsin .....         | -                          | -                | 221             | -          | -  | -  | -    | -                    | 4                | 10     | 1                   | -       | 3   |
| WEST NORTH CENTRAL ..   | 1                          | 1                | 250             | -          | 1  | -  | 1    | -                    | 19               | 28     | 3                   | 3       | 39  |
| Minnesota .....         | -                          | -                | -               | -          | -  | -  | -    | -                    | 10               | 18     | -                   | -       | 13  |
| Iowa* .....             | -                          | -                | 164             | -          | -  | -  | -    | -                    | 1                | -      | 1                   | -       | 1   |
| Missouri* .....         | 1                          | -                | 1               | -          | 1  | -  | 1    | -                    | 2                | 6      | -                   | 3       | 19  |
| North Dakota .....      | -                          | -                | 3               | -          | -  | -  | -    | -                    | -                | -      | -                   | -       | 1   |
| South Dakota .....      | -                          | 1                | 10              | -          | -  | -  | -    | -                    | 1                | -      | 1                   | -       | 1   |
| Nebraska .....          | -                          | -                | -               | -          | -  | -  | -    | -                    | 5                | 4      | 1                   | -       | -   |
| Kansas .....            | -                          | -                | 72              | -          | -  | -  | -    | -                    | -                | -      | -                   | -       | 4   |
| SOUTH ATLANTIC .....    | 16                         | -                | 247             | -          | -  | -  | 2    | -                    | 46               | 45     | 21                  | 1       | 94  |
| Delaware .....          | -                          | -                | 3               | -          | -  | -  | -    | -                    | -                | -      | -                   | -       | -   |
| Maryland .....          | 1                          | -                | 2               | -          | -  | -  | -    | -                    | 8                | 7      | 5                   | 1       | 24  |
| District of Columbia .. | -                          | -                | -               | -          | -  | -  | -    | -                    | -                | -      | -                   | -       | 6   |
| Virginia .....          | 4                          | -                | 26              | -          | -  | -  | -    | -                    | 3                | 7      | 2                   | -       | 23  |
| West Virginia .....     | -                          | -                | 91              | -          | -  | -  | -    | -                    | 4                | 4      | -                   | -       | 2   |
| North Carolina .....    | 1                          | -                | NN              | -          | -  | -  | 1    | -                    | 6                | 7      | 2                   | -       | 10  |
| South Carolina .....    | -                          | -                | -               | -          | -  | -  | -    | -                    | 6                | -      | 3                   | -       | -   |
| Georgia .....           | NA                         | NA               | NA              | NA         | NA | -  | -    | -                    | -                | NA     | NA                  | NA      | 8   |
| Florida .....           | 10                         | -                | 125             | -          | -  | -  | 1    | -                    | 19               | 20     | 9                   | -       | 21  |
| EAST SOUTH CENTRAL ..   | 6                          | -                | 135             | -          | -  | 4  | 8    | 1                    | 7                | 18     | 3                   | -       | 11  |
| Kentucky .....          | 1                          | -                | 114             | -          | -  | 2  | -    | -                    | 1                | 3      | 2                   | -       | 4   |
| Tennessee .....         | 2                          | -                | NN              | -          | -  | 2  | -    | -                    | 5                | 9      | 1                   | -       | 1   |
| Alabama .....           | 1                          | -                | 17              | -          | -  | 1  | 3    | 1                    | -                | 2      | -                   | -       | 5   |
| Mississippi .....       | 2                          | -                | 4               | -          | -  | 1  | 3    | -                    | 1                | 4      | -                   | -       | 1   |
| WEST SOUTH CENTRAL ..   | 1                          | 1                | 51              | -          | 3  | 1  | -    | 1                    | 23               | 80     | 25                  | 1       | 30  |
| Arkansas .....          | -                          | -                | 1               | -          | -  | -  | -    | -                    | 1                | 7      | -                   | -       | 3   |
| Louisiana .....         | -                          | -                | NN              | -          | -  | -  | -    | -                    | 4                | 24     | 6                   | -       | 2   |
| Oklahoma .....          | -                          | -                | 22              | -          | -  | -  | -    | -                    | 2                | 6      | 2                   | -       | -   |
| Texas* .....            | 1                          | 1                | 68              | -          | 3  | 1  | -    | 1                    | 16               | 43     | 17                  | 1       | 25  |
| MOUNTAIN .....          | -                          | -                | 173             | -          | 6  | -  | -    | -                    | 12               | 79     | 12                  | -       | 15  |
| Montana* .....          | -                          | -                | 17              | -          | -  | -  | -    | -                    | -                | 8      | -                   | -       | 2   |
| Idaho .....             | -                          | -                | 63              | -          | -  | -  | -    | -                    | -                | -      | -                   | -       | -   |
| Wyoming .....           | -                          | -                | -               | -          | -  | -  | -    | -                    | -                | -      | 2                   | -       | 2   |
| Colorado .....          | -                          | -                | 64              | -          | -  | -  | -    | -                    | 7                | 13     | -                   | -       | 7   |
| New Mexico .....        | -                          | -                | -               | -          | 5  | -  | -    | -                    | 1                | 12     | 3                   | -       | 2   |
| Arizona* .....          | -                          | -                | NN              | -          | 1  | -  | -    | -                    | 3                | 40     | 4                   | -       | 2   |
| Utah .....              | -                          | -                | 29              | -          | -  | -  | -    | -                    | 1                | 6      | 3                   | -       | -   |
| Nevada .....            | -                          | -                | -               | -          | -  | -  | -    | -                    | -                | -      | -                   | -       | -   |
| PACIFIC .....           | 1                          | -                | 102             | -          | 66 | -  | 3    | -                    | 2                | 24     | -                   | -       | 130 |
| Washington .....        | -                          | -                | 56              | -          | 60 | -  | -    | -                    | 1                | 5      | -                   | -       | 5   |
| Oregon .....            | -                          | -                | 1               | -          | -  | -  | -    | -                    | 1                | 12     | -                   | -       | 2   |
| California .....        | NA                         | NA               | NA              | NA         | 4  | NA   | 3    | -                    | -                | NA     | NA                  | NA      | 117 |
| Alaska .....            | -                          | -                | 3               | -          | 2  | -  | -    | -                    | -                | 3      | -                   | -       | 2   |
| Hawaii .....            | 1                          | -                | 2               | -          | -  | -  | -    | -                    | -                | 4      | -                   | -       | 4   |
| Guam* .....             | NA                         | NA               | NA              | NA         | -  | NA   | -    | -                    | -                | NA     | NA                  | NA      | -   |
| Puerto Rico .....       | -                          | -                | 1               | -          | 1  | -  | -    | -                    | -                | 1      | -                   | -       | 2   |
| Virgin Islands .....    | -                          | -                | -               | -          | -  | -  | -    | -                    | -                | -      | -                   | -       | -   |

NN: Not notifiable

NA: Not available

\*The following delayed reports will be reflected in next week's issue: Asep. menng.: Mo. +2; Chickenpox: Iowa +4, Mont. +1, Guam +7; Hep. A: Pa. -10, Tex. +1, Ariz. -1, Guam +1; Hep. unsp.: Tex. -2, Ariz. -3.

Table III-Continued  
**Cases of Specified Notifiable Diseases: United States**  
 Weeks Ending December 24, 1977 and December 25, 1976 - 51st Week

| REPORTING AREA             | MEASLES (Rubeola) |            |        | MENINGOCOCCAL INFECTIONS<br>TOTAL |            |       | MUMPS |              | PERTUSSIS | RUBELLA |              | TETANUS      |
|----------------------------|-------------------|------------|--------|-----------------------------------|------------|-------|-------|--------------|-----------|---------|--------------|--------------|
|                            | 1977              | CUMULATIVE |        | 1977                              | CUMULATIVE |       | 1977  | CUM.<br>1977 | 1977      | 1977    | CUM.<br>1977 | CUM.<br>1977 |
|                            |                   | 1977       | 1976   |                                   | 1977       | 1976  |       |              |           |         |              |              |
| UNITED STATES .....        | 205               | 54,556     | 39,388 | 35                                | 1,728      | 1,507 | 335   | 19,824       | 61        | 137     | 19,924       | 70           |
| NEW ENGLAND .....          | 5                 | 2,507      | 504    | 3                                 | 82         | 77    | 10    | 764          | 2         | -       | 1,233        | 1            |
| Maine .....                | 1                 | 174        | 10     | -                                 | 4          | 1     | -     | 82           | -         | -       | 71           | -            |
| New Hampshire .....        | 2                 | 514        | 10     | -                                 | 4          | 7     | 3     | 58           | 2         | -       | 247          | -            |
| Vermont .....              | NA                | 294        | 144    | -                                 | 8          | 6     | NA    | 8            | NA        | NA      | 65           | -            |
| Massachusetts* .....       | 2                 | 649        | 39     | -                                 | 24         | 26    | 1     | 137          | -         | -       | 391          | -            |
| Rhode Island .....         | -                 | 65         | 15     | -                                 | 2          | 8     | -     | 68           | -         | -       | 136          | -            |
| Connecticut .....          | -                 | 811        | 286    | 3                                 | 43         | 29    | 6     | 371          | -         | -       | 323          | 1            |
| MIDDLE ATLANTIC .....      | 24                | 8,564      | 7,417  | 11                                | 246        | 223   | 27    | 1,479        | 10        | 31      | 6,167        | 7            |
| Upstate New York .....     | 11                | 3,853      | 2,572  | 2                                 | 53         | 86    | 13    | 362          | 7         | 5       | 3,393        | 2            |
| New York City .....        | 3                 | 604        | 493    | 3                                 | 70         | 55    | 6     | 535          | 1         | -       | 335          | 1            |
| New Jersey .....           | -                 | 210        | 627    | 2                                 | 56         | 35    | 3     | 377          | -         | 7       | 1,793        | 2            |
| Pennsylvania* .....        | 10                | 3,677      | 3,325  | 4                                 | 67         | 47    | 5     | 205          | 2         | 19      | 649          | 2            |
| EAST NORTH CENTRAL .....   | 107               | 11,959     | 17,108 | 2                                 | 179        | 181   | 142   | 6,752        | 3         | 63      | 4,217        | 8            |
| Ohio .....                 | 1                 | 1,866      | 626    | 1                                 | 71         | 68    | 12    | 848          | -         | 3       | 1,147        | 3            |
| Indiana .....              | -                 | 4,372      | 4,333  | -                                 | 15         | 16    | -     | 368          | -         | -       | 986          | 1            |
| Illinois .....             | 15                | 1,904      | 1,569  | -                                 | 26         | 20    | 45    | 1,334        | -         | -       | 361          | 2            |
| Michigan .....             | 86                | 1,332      | 6,110  | 1                                 | 51         | 65    | 63    | 2,307        | 3         | 42      | 1,127        | 2            |
| Wisconsin .....            | 5                 | 2,465      | 4,163  | -                                 | 16         | 12    | 22    | 1,895        | -         | 18      | 596          | -            |
| WEST NORTH CENTRAL .....   | 11                | 9,434      | 1,654  | 2                                 | 91         | 100   | 53    | 4,486        | 4         | 3       | 633          | 10           |
| Minnesota .....            | 3                 | 2,647      | 431    | 2                                 | 27         | 14    | -     | 38           | -         | 1       | 18           | 2            |
| Iowa* .....                | 5                 | 4,329      | 135    | -                                 | 10         | 10    | 3     | 1,343        | -         | -       | 179          | 1            |
| Missouri* .....            | 3                 | 920        | 449    | -                                 | 38         | 50    | 18    | 1,641        | 4         | -       | 47           | 4            |
| North Dakota .....         | -                 | 29         | 3      | -                                 | 1          | 3     | -     | 21           | -         | -       | 21           | -            |
| South Dakota .....         | -                 | 75         | 4      | -                                 | 6          | 3     | -     | 59           | -         | -       | 89           | -            |
| Nebraska .....             | -                 | 214        | 55     | -                                 | 2          | 6     | 1     | 85           | -         | -       | 3            | -            |
| Kansas .....               | -                 | 1,220      | 807    | -                                 | 7          | 14    | 31    | 1,299        | -         | 2       | 276          | 3            |
| SOUTH ATLANTIC .....       | 10                | 4,738      | 2,276  | 5                                 | 378        | 299   | 21    | 956          | 1         | 4       | 1,737        | 14           |
| Delaware .....             | -                 | 22         | 131    | -                                 | 7          | 9     | -     | 153          | -         | -       | 29           | -            |
| Maryland .....             | -                 | 372        | 715    | 1                                 | 29         | 26    | 1     | 88           | -         | -       | 6            | 1            |
| District of Columbia ..... | -                 | 14         | 13     | -                                 | 1          | 6     | 1     | 7            | -         | -       | -            | -            |
| Virginia .....             | 2                 | 2,752      | 637    | -                                 | 37         | 43    | 4     | 127          | -         | -       | 585          | 1            |
| West Virginia .....        | 1                 | 275        | 212    | -                                 | 13         | 8     | 2     | 223          | -         | 2       | 172          | -            |
| North Carolina .....       | -                 | 66         | 18     | -                                 | 78         | 54    | 6     | 77           | -         | -       | 453          | 1            |
| South Carolina .....       | 1                 | 163        | 4      | 1                                 | 42         | 36    | -     | 21           | 1         | 1       | 238          | -            |
| Georgia .....              | NA                | 770        | 4      | -                                 | 54         | 33    | NA    | 36           | NA        | NA      | 58           | 1            |
| Florida .....              | 6                 | 304        | 342    | 3                                 | 120        | 84    | 7     | 267          | -         | 1       | 196          | 10           |
| EAST SOUTH CENTRAL .....   | 1                 | 2,062      | 571    | 6                                 | 174        | 142   | 19    | 1,201        | -         | 17      | 1,999        | 6            |
| Kentucky .....             | -                 | 1,193      | 763    | -                                 | 32         | 24    | 2     | 123          | -         | 1       | 95           | 1            |
| Tennessee .....            | 1                 | 733        | 194    | 2                                 | 48         | 64    | 10    | 662          | -         | 16      | 1,785        | 3            |
| Alabama .....              | -                 | 79         | -      | 4                                 | 59         | 40    | 7     | 372          | -         | -       | 110          | 2            |
| Mississippi .....          | -                 | 57         | 17     | -                                 | 35         | 14    | -     | 44           | -         | -       | 9            | -            |
| WEST SOUTH CENTRAL .....   | 34                | 2,242      | 852    | 5                                 | 320        | 223   | 39    | 1,794        | 5         | 10      | 848          | 14           |
| Arkansas .....             | -                 | 36         | 18     | -                                 | 21         | 16    | 1     | 153          | 4         | -       | 3            | 2            |
| Louisiana .....            | 26                | 109        | 306    | 4                                 | 142        | 43    | 6     | 67           | -         | 6       | 33           | 3            |
| Oklahoma .....             | -                 | 66         | 306    | -                                 | 15         | 25    | 4     | 592          | -         | -       | 38           | -            |
| Texas* .....               | 8                 | 2,031      | 262    | 1                                 | 142        | 139   | 28    | 982          | 1         | 4       | 774          | 9            |
| MOUNTAIN .....             | 10                | 2,567      | 5,490  | -                                 | 42         | 40    | 9     | 683          | 1         | 5       | 403          | 2            |
| Montana .....              | 7                 | 1,170      | 474    | -                                 | 7          | 6     | 1     | 14           | -         | -       | 17           | 1            |
| Idaho .....                | -                 | 163        | 2,024  | -                                 | 6          | 6     | 1     | 133          | -         | -       | 13           | -            |
| Wyoming .....              | -                 | 19         | 4      | -                                 | 2          | -     | -     | 4            | -         | -       | 6            | 1            |
| Colorado .....             | 3                 | 514        | 432    | -                                 | 1          | 6     | 3     | 302          | -         | 1       | 248          | -            |
| New Mexico .....           | -                 | 256        | 16     | -                                 | 11         | 4     | 2     | 118          | 1         | -       | 11           | -            |
| Arizona .....              | -                 | 329        | 236    | -                                 | 10         | 10    | -     | -            | -         | 2       | 25           | -            |
| Utah .....                 | -                 | 23         | 2,237  | -                                 | 4          | 6     | 2     | 95           | -         | 2       | 74           | -            |
| Nevada .....               | -                 | 93         | 67     | -                                 | 1          | 2     | -     | 17           | -         | -       | 9            | -            |
| PACIFIC .....              | 3                 | 10,503     | 2,676  | 1                                 | 216        | 222   | 15    | 1,669        | 35        | 4       | 2,687        | 8            |
| Washington .....           | -                 | 559        | 362    | -                                 | 33         | 36    | 12    | 351          | -         | 4       | 472          | -            |
| Oregon .....               | -                 | 367        | 175    | -                                 | 18         | 20    | 3     | 320          | 35        | -       | 141          | -            |
| California .....           | NA                | 9,478      | 2,322  | -                                 | 125        | 140   | NA    | 923          | NA        | NA      | 1,659        | 8            |
| Alaska .....               | -                 | 60         | 11     | 1                                 | 35         | 23    | -     | 34           | -         | -       | 1            | -            |
| Hawaii* .....              | 3                 | 39         | 6      | -                                 | 5          | 3     | -     | 41           | -         | -       | 414          | -            |
| Guam* .....                | NA                | 9          | 16     | -                                 | 1          | -     | NA    | 8            | NA        | NA      | 11           | -            |
| Puerto Rico .....          | 1                 | 1,092      | 512    | -                                 | 1          | 5     | 6     | 929          | -         | 1       | 37           | 11           |
| Virgin Islands .....       | -                 | 14         | 21     | -                                 | -          | 2     | -     | 195          | -         | -       | 2            | -            |

NA: Not available

\*The following delayed reports will be reflected in next week's issue: Measles: Mass. -1, Iowa +1, Tex. -1; Men. inf.: Pa. -1; Mumps: Iowa +1, Guam +1; Pertussis: Mo. +1; Rubella: Tex. -1, Hawaii +18.

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\*Listing of supplements to the MMWR:

Health Information for International Travel 1977. Issued August 1977

Reported Morbidity and Mortality in the United States, 1977. Annual Supplement Summary, to be published in mid-1978 as no. 53

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Table III-Continued  
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 Weeks Ending December 24, 1977 and December 25, 1976 - 51st Week

| REPORTING AREA             | TUBERCULOSIS |           | TULA-REMA | TYPHOID FEVER |           | TYPHUS-FEVER TICK-BORNE (RMSF) |           | VENEREAL DISEASES (Civilian Cases Only) |            |                        |      |           | RABIES IN ANIMALS |       |
|----------------------------|--------------|-----------|-----------|---------------|-----------|--------------------------------|-----------|---|------------|------------------------|------|-----------|-------------------|-------|
|                            | 1977         | CUM. 1977 | CUM. 1977 | 1977          | CUM. 1977 | 1977                           | CUM. 1977 | GONORRHEA                               |            | SYPHILIS (Pri. & Sec.) |      | CUM. 1977 |                   |       |
|                            |              |           |           |               |           |                                |           | 1977                                    | CUMULATIVE |                        | 1977 |           | CUMULATIVE        |       |
|                            |              |           |           |               |           | 1977                           |           |   | 1976       |                        |      |           |                   |       |
| UNITED STATES .....        | 473          | 29,458    | 159       | 5             | 373       | 6                              | 1,111     | 15,321                                  | 579,849    | 586,583                | 342  | 20,131    | 23,381            | 2,914 |
| NEW ENGLAND .....          | 34           | 1,098     | 2         | -             | 19        | -                              | 11        | 470                                     | 26,446     | 27,793                 | 11   | 789       | 818               | 49    |
| Maine .....                | 2            | 80        | -         | -             | -         | -                              | -         | 57                                      | 2,044      | 2,345                  | -    | 28        | 22                | 32    |
| New Hampshire* .....       | 1            | 29        | -         | -             | -         | -                              | -         | 26                                      | 1,106      | 845                    | -    | 5         | 10                | 1     |
| Vermont .....              | NA           | 36        | -         | NA            | -         | NA                             | -         | NA                                      | 633        | 657                    | NA   | 7         | 9                 | -     |
| Massachusetts .....        | 28           | 636       | 2         | -             | 13        | -                              | 5         | 221                                     | 11,305     | 13,211                 | 9    | 547       | 588               | 8     |
| Rhode Island .....         | -            | 87        | -         | -             | 3         | -                              | 3         | 36                                      | 2,029      | 1,991                  | -    | 10        | 19                | -     |
| Connecticut .....          | 3            | 236       | -         | -             | 3         | -                              | 3         | 133                                     | 9,332      | 8,731                  | 2    | 192       | 170               | 8     |
| MIDDLE ATLANTIC .....      | 90           | 4,727     | 3         | 1             | 71        | 1                              | 84        | 1,615                                   | 102,605    | 112,237                | 58   | 2,897     | 3,885             | 107   |
| Upstate New York .....     | 41           | 820       | 3         | -             | 8         | -                              | 41        | 203                                     | 17,768     | 18,755                 | -    | 255       | 233               | 61    |
| New York City .....        | 15           | 1,478     | -         | -             | 29        | -                              | 2         | 626                                     | 39,599     | 49,511                 | 45   | 1,836     | 2,474             | -     |
| New Jersey* .....          | 17           | 1,192     | -         | -             | 22        | -                              | 11        | 305                                     | 18,189     | 17,369                 | 10   | 385       | 544               | 28    |
| Pennsylvania .....         | 17           | 1,237     | -         | 1             | 12        | 1                              | 30        | 481                                     | 27,049     | 27,602                 | 3    | 421       | 637               | 18    |
| EAST NORTH CENTRAL .....   | 119          | 4,604     | 3         | 1             | 34        | -                              | 40        | 3,554                                   | 155,805    | 155,494                | 67   | 2,104     | 2,037             | 162   |
| Ohio* .....                | 16           | 835       | 1         | -             | 10        | -                              | 20        | 748                                     | 40,809     | 38,748                 | 16   | 474       | 491               | 16    |
| Indiana .....              | 4            | 516       | -         | -             | 3         | -                              | 2         | 636                                     | 14,941     | 15,189                 | 17   | 171       | 104               | 11    |
| Illinois .....             | 69           | 1,775     | -         | 1             | 7         | -                              | 16        | 1,275                                   | 50,336     | 53,432                 | 22   | 1,103     | 1,080             | 42    |
| Michigan* .....            | 21           | 1,269     | -         | -             | 13        | -                              | 2         | 699                                     | 36,159     | 34,314                 | 9    | 247       | 255               | 6     |
| Wisconsin .....            | 9            | 209       | 2         | -             | 1         | -                              | -         | 196                                     | 13,563     | 13,811                 | 3    | 139       | 137               | 87    |
| WEST NORTH CENTRAL .....   | 18           | 1,005     | 28        | -             | 24        | -                              | 34        | 732                                     | 50,819     | 52,139                 | 11   | 450       | 469               | 749   |
| Minnesota .....            | 4            | 206       | -         | -             | 5         | -                              | -         | 109                                     | 9,079      | 9,089                  | 3    | 155       | 133               | 269   |
| Iowa .....                 | 2            | 93        | -         | -             | -         | -                              | 1         | 71                                      | 5,952      | 6,458                  | 1    | 41        | 45                | 125   |
| Missouri .....             | 3            | 437       | 25        | -             | 14        | -                              | 18        | 356                                     | 21,035     | 20,845                 | 6    | 176       | 179               | 54    |
| North Dakota .....         | 3            | 36        | -         | -             | 1         | -                              | -         | 6                                       | 936        | 827                    | -    | 3         | -                 | 116   |
| South Dakota .....         | 2            | 51        | 2         | -             | -         | -                              | 2         | 38                                      | 1,585      | 1,547                  | 1    | 11        | 6                 | 139   |
| Nebraska .....             | 2            | 41        | 1         | -             | 1         | -                              | 2         | 20                                      | 4,350      | 4,380                  | -    | 24        | 45                | 3     |
| Kansas* .....              | 2            | 147       | -         | -             | 3         | -                              | 11        | 132                                     | 7,880      | 6,993                  | -    | 40        | 91                | 43    |
| SOUTH ATLANTIC .....       | 97           | 6,389     | 12        | 2             | 61        | 1                              | 579       | 3,851                                   | 240,247    | 239,827                | 63   | 5,385     | 6,968             | 349   |
| Delaware .....             | -            | 53        | -         | -             | -         | -                              | 3         | NA                                      | 3,176      | 3,338                  | NA   | 20        | 65                | 2     |
| Maryland* .....            | 17           | 916       | 2         | -             | 5         | -                              | 77        | 592                                     | 33,275     | 31,213                 | 6    | 316       | 536               | -     |
| District of Columbia ..... | 5            | 335       | -         | -             | 1         | -                              | -         | 261                                     | 15,757     | 16,175                 | 11   | 537       | 548               | -     |
| Virginia .....             | 8            | 726       | 3         | -             | 10        | 1                              | 154       | 429                                     | 25,078     | 25,220                 | NA   | 529       | 665               | 5     |
| West Virginia .....        | 7            | 237       | -         | -             | 6         | -                              | 5         | 68                                      | 3,416      | 3,126                  | -    | 5         | 22                | 9     |
| North Carolina* .....      | 16           | 1,053     | 2         | -             | 5         | -                              | 221       | 583                                     | 36,086     | 34,834                 | 11   | 715       | 1,237             | 13    |
| South Carolina .....       | NA           | 581       | 2         | -             | 7         | -                              | 53        | 431                                     | 23,092     | 22,750                 | 8    | 251       | 371               | 36    |
| Georgia .....              | NA           | 878       | 3         | NA            | 5         | NA                             | 65        | 555                                     | 45,902     | 45,291                 | 27   | 1,240     | 1,375             | 236   |
| Florida .....              | 44           | 1,606     | -         | 2             | 22        | -                              | 1         | 932                                     | 57,471     | 57,880                 | NA   | 1,772     | 2,449             | 78    |
| EAST SOUTH CENTRAL .....   | 51           | 2,760     | 10        | -             | 10        | 2                              | 178       | 1,273                                   | 86,218     | 86,376                 | 9    | 768       | 875               | 78    |
| Kentucky .....             | 15           | 723       | 3         | -             | 5         | -                              | 43        | 28                                      | 11,583     | 11,300                 | -    | 108       | 120               | 29    |
| Tennessee .....            | 7            | 878       | 6         | -             | 2         | 1                              | 106       | 568                                     | 33,996     | 34,752                 | -    | 243       | 290               | 37    |
| Alabama .....              | 9            | 669       | 1         | -             | 1         | 1                              | 20        | 466                                     | 23,881     | 23,887                 | -    | 161       | 188               | 12    |
| Mississippi .....          | 20           | 490       | -         | -             | 2         | -                              | 9         | 211                                     | 16,758     | 16,437                 | 9    | 256       | 277               | -     |
| WEST SOUTH CENTRAL .....   | 38           | 3,458     | 77        | -             | 34        | 2                              | 166       | 2,587                                   | 125,327    | 124,030                | 99   | 2,952     | 2,798             | 764   |
| Arkansas .....             | 3            | 374       | 53        | -             | 8         | 1                              | 55        | 168                                     | 9,344      | 11,879                 | -    | 63        | 102               | 115   |
| Louisiana* .....           | 8            | 606       | 1         | -             | 1         | -                              | 6         | 288                                     | 19,085     | 17,788                 | 32   | 683       | 559               | 22    |
| Oklahoma .....             | 3            | 291       | 12        | -             | 2         | 1                              | 76        | 340                                     | 12,151     | 12,063                 | 2    | 83        | 93                | 241   |
| Texas* .....               | 24           | 2,187     | 11        | -             | 23        | -                              | 29        | 1,791                                   | 84,747     | 82,330                 | 65   | 2,123     | 2,344             | 386   |
| MOUNTAIN .....             | 8            | 815       | 18        | 1             | 30        | -                              | 14        | 608                                     | 39,743     | 40,424                 | 23   | 432       | 573               | 185   |
| Montana .....              | 1            | 52        | 1         | -             | -         | -                              | 6         | 39                                      | 2,106      | 2,331                  | 1    | 7         | 12                | 45    |
| Idaho .....                | -            | 31        | -         | -             | -         | -                              | 5         | 38                                      | 1,795      | 2,177                  | -    | 12        | 23                | -     |
| Wyoming .....              | -            | 19        | 1         | -             | -         | -                              | 2         | 6                                       | 930        | 826                    | -    | 3         | 7                 | 1     |
| Colorado* .....            | -            | 112       | 4         | 1             | 9         | -                              | 1         | 187                                     | 10,442     | 10,232                 | 3    | 126       | 137               | 58    |
| New Mexico .....           | 1            | 156       | 1         | -             | -         | -                              | -         | 115                                     | 5,828      | 7,046                  | 17   | 101       | 136               | 21    |
| Arizona .....              | 5            | 344       | 3         | -             | 14        | -                              | -         | 136                                     | 10,868     | 12,041                 | -    | 154       | 203               | 49    |
| Utah .....                 | -            | 43        | 8         | -             | 5         | -                              | -         | 39                                      | 2,418      | 2,261                  | 2    | 13        | 23                | 11    |
| Nevada .....               | 1            | 58        | -         | -             | 2         | -                              | -         | 48                                      | 5,356      | 3,840                  | -    | 16        | 35                | -     |
| PACIFIC .....              | 18           | 4,602     | 6         | -             | 90        | -                              | 5         | 631                                     | 152,639    | 147,266                | 1    | 4,354     | 4,958             | 471   |
| Washington .....           | NA           | 293       | -         | -             | 2         | -                              | -         | 325                                     | 12,361     | 12,391                 | NA   | 241       | 174               | 2     |
| Oregon .....               | 4            | 172       | 1         | -             | 3         | -                              | 1         | 196                                     | 10,792     | 10,820                 | 1    | 142       | 106               | 8     |
| California .....           | NA           | 3,481     | 5         | NA            | 83        | NA                             | 4         | NA                                      | 121,689    | 117,084                | NA   | 3,904     | 4,563             | 424   |
| Alaska .....               | -            | 85        | -         | -             | -         | -                              | -         | 44                                      | 4,911      | 4,278                  | -    | 27        | 29                | 37    |
| Hawaii .....               | 14           | 574       | -         | -             | 2         | -                              | -         | 66                                      | 3,186      | 2,693                  | -    | 40        | 86                | -     |
| Guam* .....                | NA           | 53        | -         | NA            | 1         | NA                             | -         | NA                                      | 158        | 336                    | NA   | 2         | 2                 | -     |
| Puerto Rico .....          | 18           | 379       | -         | -             | 7         | -                              | -         | 45                                      | 3,087      | 2,572                  | 9    | 532       | 595               | 53    |
| Virgin Islands .....       | -            | 2         | -         | -             | -         | -                              | -         | 7                                       | 225        | 219                    | -    | 9         | 52                | -     |

NA: Not available

\*The following delayed reports will be reflected in next week's issue: TB: N.H. -1, Ohio -1, Mich. -1, Kans. -2, Md. -1, N.C. -7, Guam +3; Typhoid fever: N.J. -1;

GC: La. -37, Tex. +37, Guam +3; Syphilis: La. -8; An. rabies: Colo. -1.

Table IV  
Deaths in 121 United States Cities\*  
Week Ending December 24, 1977 - 51st Week

| REPORTING AREA            | ALL CAUSES |                   |             |             |              | Pneumonia and Influenza ALL AGES | REPORTING AREA            | ALL CAUSES |                   |             |             |              | Pneumonia and Influenza ALL AGES |
|---------------------------|------------|-------------------|-------------|-------------|--------------|----------------------------------|---------------------------|------------|-------------------|-------------|-------------|--------------|----------------------------------|
|                           | ALL AGES   | 65 Years and Over | 45-64 Years | 25-44 Years | Under 1 Year |                                  |                           | ALL AGES   | 65 Years and Over | 45-64 Years | 25-44 Years | Under 1 Year |                                  |
| <b>NEW ENGLAND</b>        | 747        | 483               | 186         | 40          | 23           | 35                               | <b>SOUTH ATLANTIC</b>     | 1,139      | 643               | 326         | 78          | 50           | 45                               |
| Boston, Mass.             | 200        | 111               | 55          | 17          | 11           | 5                                | Atlanta, Ga.              | 128        | 66                | 42          | 14          | -            | 3                                |
| Bridgeport, Conn.         | 60         | 37                | 16          | 2           | 3            | 4                                | Baltimore, Md.            | 216        | 107               | 61          | 19          | 17           | 3                                |
| Cambridge, Mass.          | 31         | 23                | 8           | -           | -            | 6                                | Charlotte, N. C.          | 83         | 40                | 24          | 12          | 3            | 2                                |
| Fall River, Mass.         | 25         | 15                | 8           | 1           | 1            | 1                                | Jacksonville, Fla.        | 85         | 45                | 28          | 6           | 4            | 5                                |
| Hartford, Conn.           | 43         | 22                | 16          | 4           | 1            | -                                | Miami, Fla.               | 99         | 52                | 37          | 5           | 1            | 3                                |
| Lowell, Mass.             | 36         | 19                | 13          | 3           | -            | 2                                | Norfolk, Va.              | 42         | 25                | 13          | -           | 4            | 6                                |
| Lynn, Mass.               | 33         | 23                | 7           | 3           | -            | 1                                | Richmond, Va.             | 65         | 31                | 22          | 5           | 4            | 6                                |
| New Bedford, Mass.        | 23         | 19                | 3           | -           | -            | 1                                | Savannah, Ga.             | 32         | 23                | 6           | 2           | 1            | 2                                |
| New Haven, Conn.          | 52         | 37                | 14          | -           | 1            | 1                                | St. Petersburg, Fla.      | 119        | 96                | 18          | 1           | 3            | 6                                |
| Providence, R.I.          | 96         | 60                | 19          | 4           | 3            | 8                                | Tampa, Fla.               | 75         | 48                | 16          | 3           | 6            | 5                                |
| Somerville, Mass.         | 3          | 2                 | -           | 1           | -            | -                                | Washington, D. C.         | 154        | 83                | 52          | 9           | 3            | 3                                |
| Springfield, Mass.        | 65         | 50                | 10          | 3           | 2            | 5                                | Wilmington, Del.          | 41         | 27                | 7           | 2           | 4            | 1                                |
| Waterbury, Conn.          | 22         | 17                | 5           | -           | -            | -                                |                           |            |                   |             |             |              |                                  |
| Worcester, Mass.          | 58         | 42                | 12          | 2           | 1            | 1                                | <b>EAST SOUTH CENTRAL</b> | 633        | 378               | 166         | 49          | 16           | 35                               |
| <b>MIDDLE ATLANTIC</b>    | 3,179      | 2,025             | 816         | 170         | 87           | 164                              | Birmingham, Ala.          | 95         | 57                | 20          | 10          | 6            | 3                                |
| Albany, N. Y.             | 72         | 40                | 15          | 1           | 3            | 2                                | Chattanooga, Tenn.        | 51         | 33                | 7           | 9           | 1            | -                                |
| Allentown, Pa.            | 28         | 17                | 8           | 1           | 2            | -                                | Knoxville, Tenn.          | 25         | 18                | 5           | 2           | -            | -                                |
| Buffalo, N. Y.            | 135        | 80                | 37          | 5           | 3            | 10                               | Louisville, Ky.           | 130        | 70                | 47          | 5           | 5            | 18                               |
| Camden, N. J.             | 36         | 22                | 11          | 1           | 2            | 3                                | Memphis, Tenn.            | 148        | 85                | 43          | 13          | -            | 3                                |
| Elizabeth, N. J.          | 28         | 20                | 6           | 2           | -            | 1                                | Mobile, Ala.              | 35         | 21                | 8           | 1           | 4            | 1                                |
| Erie, Pa.                 | 24         | 15                | 9           | -           | -            | -                                | Montgomery, Ala.          | 46         | 32                | 8           | 4           | -            | 1                                |
| Jersey City, N. J.        | 62         | 30                | 17          | 1           | 5            | 3                                | Nashville, Tenn.          | 103        | 62                | 28          | 5           | -            | 9                                |
| Newark, N. J.             | 55         | 25                | 22          | 1           | 4            | 7                                | <b>WEST SOUTH CENTRAL</b> | 1,296      | 725               | 360         | 83          | 77           | 37                               |
| New York City, N. Y.      | 1,701      | 1,112             | 416         | 99          | 40           | 71                               | Austin, Tex.              | 58         | 33                | 16          | 4           | -            | 4                                |
| Paterson, N. J.           | 48         | 28                | 10          | 4           | 3            | 4                                | Baton Rouge, La.          | 34         | 16                | 11          | 1           | 5            | 1                                |
| Philadelphia, Pa.         | 418        | 239               | 114         | 33          | 14           | 26                               | Corpus Christi, Tex.      | 44         | 32                | 11          | -           | -            | 1                                |
| Pittsburgh, Pa.           | 189        | 113               | 57          | 9           | 6            | 10                               | Dallas, Tex.              | 203        | 108               | 65          | 7           | 11           | 7                                |
| Reading, Pa.              | 40         | 27                | 9           | 3           | 1            | 2                                | El Paso, Tex.             | 57         | 29                | 15          | 3           | 7            | 6                                |
| Rochester, N. Y.          | 101        | 57                | 28          | 2           | 2            | 7                                | Fort Worth, Tex.          | 97         | 60                | 21          | 5           | 7            | -                                |
| Schenectady, N. Y.        | 29         | 17                | 11          | 1           | -            | 2                                | Houston, Tex.             | 321        | 145               | 110         | 36          | 19           | 3                                |
| Scranton, Pa.             | 37         | 30                | 4           | 2           | 1            | 2                                | Little Rock, Ark.         | 44         | 25                | 10          | 4           | 3            | 1                                |
| Syracuse, N. Y.           | 92         | 57                | 18          | 4           | 1            | 6                                | New Orleans, La.          | 113        | 68                | 31          | 3           | 9            | -                                |
| Trenton, N. J.            | 39         | 20                | 13          | -           | -            | 1                                | San Antonio, Tex.         | 136        | 80                | 33          | 10          | 8            | 4                                |
| Utica, N. Y.              | 20         | 12                | 8           | -           | -            | 2                                | Shreveport, La.           | 75         | 46                | 17          | 6           | 5            | 1                                |
| Yonkers, N. Y.            | 25         | 20                | 3           | 1           | -            | 5                                | Tulsa, Okla.              | 114        | 83                | 20          | 4           | 3            | 9                                |
| <b>EAST NORTH CENTRAL</b> | 2,486      | 1,533             | 624         | 160         | 86           | 86                               | <b>MOUNTAIN</b>           | 565        | 337               | 136         | 34          | 32           | 12                               |
| Akron, Ohio               | 70         | 49                | 17          | 6           | 1            | -                                | Albuquerque, N. Mex.      | 63         | 31                | 17          | 3           | 5            | 3                                |
| Canton, Ohio              | 24         | 8                 | 14          | 1           | 1            | 1                                | Colorado Springs, Colo.   | 38         | 27                | 5           | 3           | 2            | -                                |
| Chicago, Ill.             | 605        | 370               | 146         | 52          | 17           | 16                               | Denver, Colo.             | 121        | 72                | 28          | 10          | 8            | 2                                |
| Cincinnati, Ohio          | 185        | 124               | 37          | 11          | 7            | 7                                | Las Vegas, Nev.           | 25         | 12                | 11          | 2           | -            | -                                |
| Cleveland, Ohio           | 209        | 123               | 60          | 7           | 8            | 5                                | Ogden, Utah               | 20         | 12                | 6           | -           | 1            | 1                                |
| Columbus, Ohio            | 134        | 80                | 37          | 10          | 5            | -                                | Phoenix, Ariz.            | 135        | 77                | 35          | 8           | 9            | 1                                |
| Dayton, Ohio              | 105        | 69                | 26          | 5           | 3            | 1                                | Pueblo, Colo.             | 24         | 18                | 3           | 2           | 1            | 2                                |
| Detroit, Mich.            | 264        | 153               | 73          | 13          | 11           | 7                                | Salt Lake City, Utah      | 49         | 33                | 8           | 3           | 4            | 3                                |
| Evansville, Ind.          | 51         | 29                | 14          | 4           | 4            | 4                                | Tucson, Ariz.             | 90         | 55                | 23          | 3           | 2            | -                                |
| Fort Wayne, Ind.          | 54         | 39                | 12          | 3           | -            | 6                                | <b>PACIFIC</b>            | 1,510      | 980               | 358         | 83          | 45           | 42                               |
| Gary, Ind.                | 30         | 11                | 13          | 4           | 1            | -                                | Berkeley, Calif.          | 25         | 21                | 4           | -           | -            | 1                                |
| Grand Rapids, Mich.       | 56         | 40                | 11          | 3           | 2            | 8                                | Fresno, Calif.            | 70         | 44                | 15          | 4           | 6            | 3                                |
| Indianapolis, Ind.        | 192        | 107               | 52          | 14          | 12           | 2                                | Glendale, Calif.          | 20         | 15                | 3           | 2           | -            | 1                                |
| Madison, Wis.             | 45         | 28                | 9           | 3           | 2            | 10                               | Honolulu, Hawaii          | 61         | 41                | 14          | 1           | 3            | 1                                |
| Milwaukee, Wis.           | 112        | 77                | 28          | 3           | 2            | 1                                | Long Beach, Calif.        | 93         | 58                | 25          | 5           | 2            | 1                                |
| Peoria, Ill.              | 46         | 21                | 15          | 6           | 4            | 9                                | Los Angeles, Calif.       | 343        | 219               | 87          | 23          | 6            | 7                                |
| Rockford, Ill.            | 50         | 37                | 6           | 3           | 2            | 3                                | Oakland, Calif.           | 58         | 40                | 10          | 2           | 2            | 2                                |
| South Bend, Ind.          | 44         | 29                | 12          | 1           | -            | 3                                | Pasadena, Calif.          | 33         | 18                | 11          | 1           | 2            | 1                                |
| Toledo, Ohio              | 121        | 84                | 29          | 2           | 1            | 1                                | Portland, Oreg.           | 151        | 98                | 32          | 7           | 10           | 6                                |
| Youngstown, Ohio          | 83         | 55                | 13          | 9           | 3            | 2                                | Sacramento, Calif.        | 71         | 46                | 23          | -           | 1            | 4                                |
| <b>WEST NORTH CENTRAL</b> | 920        | 503               | 192         | 40          | 35           | 31                               | San Diego, Calif.         | 129        | 76                | 34          | 9           | 4            | 3                                |
| Des Moines, Iowa          | 60         | 41                | 12          | 2           | 2            | 2                                | San Francisco, Calif.     | 161        | 100               | 38          | 11          | 6            | 2                                |
| Duluth, Minn.             | 30         | 18                | 5           | 1           | 4            | 2                                | San Jose, Calif.          | 67         | 47                | 11          | 5           | 1            | -                                |
| Kansas City, Kans.        | 28         | 16                | 6           | 4           | 1            | 3                                | Seattle, Wash.            | 149        | 102               | 35          | 9           | 1            | 8                                |
| Kansas City, Mo.          | 139        | 88                | 32          | 6           | 7            | -                                | Spokane, Wash.            | 40         | 29                | 8           | 2           | -            | 2                                |
| Lincoln, Nebr.            | 38         | 32                | 3           | -           | -            | 4                                | Tacoma, Wash.             | 39         | 26                | 8           | 2           | 1            | -                                |
| Minneapolis, Minn.        | 101        | 70                | 18          | 5           | 3            | 3                                | <b>TOTAL</b>              | 12,475     | 7,707             | 3,164       | 737         | 451          | 487                              |
| Omaha, Nebr.              | 108        | 67                | 26          | 6           | 5            | 3                                | <b>Expected Number</b>    | 12,118     | 7,379             | 3,118       | 720         | 429          | 461                              |
| St. Louis, Mo.            | 218        | 137               | 55          | 10          | 6            | 5                                |                           |            |                   |             |             |              |                                  |
| St. Paul, Minn.           | 74         | 59                | 9           | 1           | -            | 2                                |                           |            |                   |             |             |              |                                  |
| Wichita, Kans.            | 124        | 75                | 26          | 5           | 7            | 7                                |                           |            |                   |             |             |              |                                  |

\*By place of occurrence and week of filing certificate. Excludes fetal deaths.

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### *Viral Hepatitis – Continued*

in the incidence of hepatitis B was observed in the HBIG treated individuals. However, at 9 and 12 months of follow-up, no statistically significant differences in the incidence of hepatitis B between the globulin groups could be observed due to the occurrence of late-onset cases in HBIG recipients. The pre-exposure study among dialysis patients and staff also provided additional evidence that administration of low titered globulin may have been associated with the development of passive-active immunity in recipients.

One recent study of ISG in postexposure prophylaxis has indicated that hepatitis B was prevented in infants who received this material within a week of birth to mothers who had experienced acute hepatitis B in the third trimester of pregnancy.

The above studies provide independent evidence for the efficacies of both ISG containing low titers of anti-HBs and of HBIG in both pre-exposure and postexposure prophylaxis of hepatitis B. With the exception of the previously cited experimental study of postexposure prophylaxis among children in a custodial institution, there is no statistically or epidemiologically convincing evidence of the superiority of HBIG over such ISG preparations under circumstances permitting these comparisons.

It has been proposed that the late-onset cases in HBIG recipients in the 2 multicenter studies were due to re-exposure at a time when the protective effect of HBIG had diminished, thus masking an inferred relative superiority of HBIG over low anti-HBs titered globulins. It has also been proposed, however, that administration of HBIG itself prolongs the incubation period of hepatitis B for those cases which do break through after passive immunization.

Whereas there are no extant data to support the re-exposure hypothesis, there is convincing evidence cited above that HBIG does prolong the incubation period of hepatitis B. Additional support for this interpretation is provided from a recent study in which hepatitis B incubation periods of 7 and 8 months were documented following HBIG administration. Further, it is difficult to explain, under circumstances of adequate randomization, as reported in the multicenter studies, an excess late re-exposure to HBV occurring in HBIG recipients only. On balance it seems likely that the late-onset cases in HBIG recipients in the multicenter studies were due, in part, to prolongation of the incubation period of hepatitis B. Therefore, the relative superiority of HBIG over ISG in these 2 studies cannot be convincingly affirmed.

In all studies reviewed to date there has been no evidence of infectivity of HBIG or ISG or of increased incidence of HBsAg carriage among infected individuals given anti-HBs containing globulins. Therefore, passive immunization for hepatitis B is considered to be safe. Efficacy of immune globulins in the prevention of hepatitis B varies from 40 to 70%. For this reason, passive immunization should not replace other forms of infection control that can be expected to be more efficacious in the prevention of hepatitis B. This is of particular significance for reducing disease in hemodialysis unit patients and staff. Data have shown that hepatitis B transmission may be virtually eliminated through appropriate environmental containment procedures involving early identification and segregation of HBsAg-positive individuals.

In cases of massive single exposure to HBV, such as acci-

dental transfusion of HBsAg-positive blood or high-risk plasma derivatives, there are no available data from controlled studies which indicate that immune globulins containing anti-HBs may be effective. Therefore, control of post-transfusion hepatitis B should be approached through elimination of HBsAg-positive transfused products by routine testing using the most sensitive available methods.

### **GUIDELINES FOR PROPHYLAXIS OF HEPATITIS B**

The following guidelines are believed to reflect the best available synthesis of current data. It is understood that these guidelines may be subject to change as new information becomes available. Use of ISG refers to lots of material which contain some anti-HBs detectable by PHA techniques. Lots of such material currently manufactured in the United States may be reasonably expected to contain such antibody.

#### **Postexposure Prophylaxis**

**Acute exposure:** The major indication for use of HBIG is following a single acute exposure to a relatively large inoculum of HBV, such as occurs following accidental needle-stick or mucosal exposure to blood known to contain HBsAg. HBIG in a dose of 0.05-0.07 ml/k of body weight may be administered as soon as possible within a 7-day period after exposure, with a second, identical dose administered 25-30 days after the first. If HBIG is not available, ISG can be given in the same dosage schedule.

**Fetal exposure:** Infants born to mothers with acute hepatitis B in the third trimester of pregnancy and HBsAg seropositivity at time of delivery may be given either HBIG or ISG within 7 days of birth. HBIG has been administered as a single dose of 0.13 ml/k of body weight. ISG has been similarly administered at a dose of 0.5 ml/k of body weight.

#### **Pre-exposure Prophylaxis**

In certain endemic settings where HBV transmission is known to occur and repeated chronic virus exposure is fully documented, passive immunization may be considered. In these situations, routine serologic monitoring of the HBsAg and anti-HBs status of candidate persons should be a routine component of hepatitis prevention and control.

Although HBIG has been shown in one study to prevent hepatitis B in spouses of individuals with acute HBV infection, recommendations for passive immunization to prevent hepatitis B, presumably acquired by sexual or other such intimate contact, should await further estimates of the magnitude of risk of disease transmitted by these routes, as well as studies of the relative prophylactic efficacies of HBIG vs. ISG.

**Hemodialysis units:** Passive immunization is not routinely recommended for staff and patients of hemodialysis units. Rather, hepatitis B prevention and control should be based on routine serologic screening, as described above, as well as implementation of hygienic measures. Under conditions where such hygienic measures cannot be implemented, passive immunization may be considered for anti-HBs-negative staff and patients. HBsAg-positive individuals should not be included. All passive immunization should be discontinued when evidence for endemic HBV transmission ceases to exist. Since there is no convincing evidence for a superior efficacy of HBIG, and in order to take advantage of the possibility of acquisition of passive-active immunity,

*Viral Hepatitis – Continued*

prophylaxis with ISG may be preferred. A dose of 0.05-0.07 ml/kg of body weight has been administered at 4-month intervals. Individuals receiving prophylaxis should be tested for anti-HBs prior to reimmunization. Those found to be anti-HBs-positive may be removed from further prophylaxis under presumption of the acquisition of active anti-HBs response.

**Custodial institutions for the mentally retarded:** Under conditions of demonstrable HBV transmission with repeated chronic virus exposure and where routine serologic monitoring for HBsAg and anti-HBs status of patients and staff is undertaken, passive immunization of anti-HBs-negative individuals can be considered. ISG administered in the same dosage, at the same intervals, and under the same conditions for discontinuation as outlined for hemodialysis units may be preferred.

**PRECAUTIONS**

Immune globulin preparations should not be administered intravenously because of the possibility of severe hypersensitivity reactions.

Intramuscular administration of immune globulins rarely causes adverse reactions. Discomfort may occur at the site of injection, especially with larger volumes. A few instances of hypersensitivity have been reported, but in view of the very large numbers of persons who receive immune globulins, the risk is small. Antibody against gamma globulin may appear following administration of immune globulins, although its significance is unknown. When immune globulin is needed, this theoretical consideration should not preclude its administration.

The induction of immune complex disorders following the administration of HBIG to HBsAg-positive persons is a potential concern, but such reactions have not been observed. Although HBsAg testing of potential HBIG recipients is not mandatory, HBIG should not knowingly be given to HBsAg positives.

Pregnancy is not a contraindication to using ISG or HBIG as recommended.

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*Current Trends***Results of Screening for Gonorrhea – United States  
6-Month Period Ending June 31, 1977**

In the 6-month period ending June 31, 1977, a total of 4,249,511 specimens were taken from women as part of gonorrhea screening programs; 184,140 (4.3%) were found to be positive. The table reflects the results of such screening by types of health care facilities securing the specimen. Although the positivity rates were highest (17.6%) in venereal disease clinics, 89% of all tests were performed in other settings. In these settings culture-positivity rates in women ranged from 1.5% in private family planning groups to 5.0% for women in manpower training agencies and women in

the "not specified" category. Among 965,230 women tested by private physicians, cultures from 18,479 (1.9%) were positive.

Provisional data indicate that an additional 2,151,887 women were tested at all types of facilities in July, August, and September 1977 or about 717,296 per month. For this period, the overall positivity rate of cultures from all sources was 5.1%.

*Reported by Venereal Disease Control Div, Bur of State Services, CDC.*

## Gonorrhea — Continued

TABLE 1. Results of gonorrhea culture tests on females — United States\*, January 1977 — June 1977

| REPORTING SOURCE                             | NUMBER TESTED | NUMBER POSITIVE | PERCENT POSITIVE | REPORTING SOURCE                                    | NUMBER TESTED | NUMBER POSITIVE | PERCENT POSITIVE |
|--|---------------|-----------------|------------------|---|---------------|-----------------|------------------|
| Health Care Providers (Excluding VD Clinics) | 3,786,588     | 102,524         | 2.7              | Health Care Providers (Excluding VD Clinics—Con't.) |               |                 |                  |
| Health Department Non-VD Clinic              | 922,672       | 28,480          | 3.1              | Private Physicians                                  | 965,230       | 18,479          | 1.9              |
| Family Planning                              | 641,816       | 19,075          | 3.0              | Private Family Planning Groups                      | 510,713       | 7,774           | 1.5              |
| Prenatal, Ob-Gyn                             | 90,522        | 2,604           | 2.9              | Group Health Clinics                                | 68,276        | 1,439           | 2.1              |
| Cancer Detection                             | 12,763        | 231             | 1.8              | Student Health Centers                              | 114,120       | 1,928           | 1.7              |
| Combinations or Other                        | 177,571       | 6,570           | 3.7              | Manpower Training Agencies                          | 6,947         | 344             | 5.0              |
| Public/Private Hospital—Outpatient           | 681,302       | 27,833          | 4.1              | Industrial Screening                                | 2,365         | 40              | 1.7              |
| Family Planning                              | 128,755       | 3,725           | 2.9              | Military/Dependents                                 | 38,531        | 976             | 2.5              |
| Prenatal, Ob-Gyn                             | 167,869       | 5,069           | 3.0              | Correctional or Detention Centers                   | 32,991        | 1,614           | 4.9              |
| Cancer Detection                             | 4,656         | 132             | 2.8              | Not Specified                                       | 63,802        | 3,199           | 5.0              |
| Combinations or Other                        | 380,022       | 18,907          | 5.0              | Venereal Disease Clinics                            | 462,923       | 81,616          | 17.6             |
| Public/Private Hospital—Inpatient            | 29,068        | 672             | 2.3              | TOTAL (All Clinics)                                 | 4,249,511     | 184,140         | 4.3              |
| Obstetric                                    | 1,803         | 44              | 2.4              |   |               |                 |                  |
| Gynecologic                                  | 438           | 18              | 4.1              |   |               |                 |                  |
| Combinations or Other                        | 26,827        | 610             | 2.3              |   |               |                 |                  |
| Community Health Centers                     | 350,571       | 9,746           | 2.8              |   |               |                 |                  |
| Family Planning                              | 93,801        | 1,729           | 1.8              |   |               |                 |                  |
| Prenatal, Ob-Gyn                             | 24,384        | 613             | 2.5              |   |               |                 |                  |
| Cancer Detection                             | 4,011         | 18              | .5               |   |               |                 |                  |
| Combinations or Other                        | 228,375       | 7,386           | 3.2              |   |               |                 |                  |

Excludes Trust Territories (January — June 1977)

Source: CDC 9.124, CDC Venereal Disease Control Division, Atlanta, Georgia

## Epidemiologic Notes and Reports

## Follow-up on Legionnaires' Disease — United States

As of December 23, 1977, 150 sporadic cases of Legionnaires' disease with onset since August 1976 confirmed by 4-fold or greater rise in indirect fluorescent antibody titer, demonstration of the causative bacterium in tissue by the direct fluorescent antibody technique, or growth of the bacterium from clinical specimens have been reported to CDC. These include 32 fatalities. In addition, several states have reported apparently localized clusters of confirmed cases occurring predominantly in the summer and autumn of 1977. The revised totals for these clusters are as follows:

Ohio, 10 cases and 1 death; Vermont, 32 cases and 17 deaths; Tennessee, 25 cases and 3 deaths; and California, 14 cases and 2 deaths.

Reported by TJ Halpin, MD, State Epidemiologist, Ohio State Dept of Health; RL Vogt, MD, Acting State Epidemiologist, Vermont State Dept of Health; RH Hutcheson, Jr, MD, State Epidemiologist, Tennessee State Dept of Public Health; J Chin, MD, State Epidemiologist, California Dept of Health; Bacteriology Div and Virology Div, Bur of Laboratories, and Bacterial Diseases Div, Bur of Epidemiology, CDC.

## Follow-up on Deaths in Persons on Liquid Protein Diets

The investigation by the Food and Drug Administration and CDC into the deaths in persons on liquid protein diets is continuing. Forty reports of deaths have been or are presently being investigated.

The 10 deaths originally reported (1) were in women without serious underlying disease who died from cardiac arrhythmias after prolonged and exclusive use of liquid protein products for weight reduction. An additional 5 cases have now been identified which fit this pattern.

All 15 deaths were in females who ranged in age from 25 to 51 years. They had dieted for an average of 5 months and had lost an average of 83 pounds. All adhered strictly to the diet, and 12 of the 15 were under medical supervision. Fourteen women took supplemental vitamin-mineral tablets, and 13 took supplemental potassium. Four deaths occurred within 2 weeks after the women had stopped the diet.

Laboratory findings in the last 5 cases were similar to those noted previously. Serum potassium tended to be slightly low; when measured, serum calcium, phosphate,

and magnesium tended to be normal. A distinctive electrocardiogram was found, characterized by a prolonged QT interval in 6 of 9 women; sometimes this was associated with decreased voltage.

Autopsies were performed on 14 of the cases. Complete information is available on 13; 7 of these showed a form of myocarditis. An eighth showed degeneration of the myocardium without inflammation.

In addition to the 15 cases described above, 3 other deaths were studied that occurred in individuals without underlying disease. One woman died of a perforated stomach after starting to eat again. One man and one woman died of pancreatitis.

The remaining deaths were in persons who either had underlying disease or are still under investigation.

Reported by the Food and Drug Administration; Field Services Div, Chronic Diseases Div, and Bacterial Diseases Div, Bur of Epidemiology, CDC.

## Reference

1. MMWR 26:383, 1977

International Notes**Influenza — United States, USSR**

**United States:** Widespread outbreaks of influenza-like illness with increased school absenteeism were reported before Christmas in Wisconsin, New Jersey, Pennsylvania, and Tennessee. In New Jersey, influenza virus isolations have been made in 11 of 21 counties, and in Pennsylvania and Tennessee influenza A(H3N2) viruses have also been isolated from school outbreaks in several districts. In New York, influenza A(H3N2) viruses were responsible for increased school absenteeism in the Albany and Suffolk County areas. Outbreaks have also occurred in 3 counties in Michigan. At a Brighton, Colorado, nursing home 50 of 125 residents had an influenza-like illness; 5 died.

Several influenza A viruses isolated from outbreaks in New Jersey, Pennsylvania, and Tennessee have been characterized as resembling A/Texas/1/77. A/Texas/1/77-like strains were also isolated from outbreaks and sporadic cases in Michigan. Additional A/Texas/1/77-like strains have been isolated recently from sporadic cases in Arizona, Georgia, and Hawaii. In Missouri, however, both A/Texas/1/77-like and A/Victoria/3/75-like strains were isolated during a small influenza outbreak among recruits at Fort Leonard Wood. An A/Victoria/3/75-like strain has also been isolated from an 80-year-old nursing home resident in Wisconsin, where A/Texas/1/77-like strains had previously been isolated from university students (1). The University of Colorado reports that an influenza A(H3N2) isolate from the Brighton nursing home outbreak also may be similar to A/Victoria/3/75, as with other recent isolates in Colorado (2).

No H1N1 virus strains have been identified in the United States. Antibody prevalence in the U.S. population against recent H1N1 viruses from the USSR (reference strain A/USSR/90/77) is shown in Table 2.

**USSR:** Outbreaks attributed to influenza illness are widespread. Cities reporting outbreaks include Riga, Murmansk, Kuibyshev, Poltova, Khabarovsk, Vladivostok, Leningrad, and Moscow. Initial reports indicate that approximately

75% of the virus isolates are H1N1 strains (reference strain A/USSR/90/77), and 25% are H3N2 strains resembling A/Texas/1/77 or A/Victoria/3/75. Nationwide attack rates are estimated to be approximately one-half that of the Asian (1957-58) and Hong Kong (1969-70) epidemics, affecting mostly persons under 20 years of age.

TABLE 2. Influenza A(H1N1) antibody prevalence in serum samples obtained mid-1976, United States

| Age (yrs)<br>in 1977 | No.<br>tested | Cumulative % with HI antibody titers<br>to A/USSR/90/77 |     |     |      |
|----------------------|---------------|---|-----|-----|------|
|                      |               | ≥20   | ≥40 | ≥80 | ≥160 |
| <24                  | 57            | 0   | 0   | 0   | 0    |
| 24-33                | 19            | 42  | 37  | 16  | 5    |
| 34-50                | 24            | 29  | 17  | 4   | 0    |
| 51-62                | 18            | 11  | 0   | 0   | 0    |
| 63-94                | 42            | 10  | 5   | 2   | 0    |

Reported by G Meikeljohn, MD, University of Colorado Medical Center; HF Maassab, PhD, A Monto, MD, University of Michigan School of Public Health; appropriate State and Territorial Epidemiologists and State Laboratory Directors; WHO Collaborating Center for Influenza, Respiratory Virology Br, Virology Div, Bur of Laboratories, Surveillance and Assessment Br, Immunization Div, Bur of State Services, CDC.

**Editorial Note:** In the United States influenza A(H3N2) viruses have been isolated during this influenza season in 15 states and Puerto Rico. A/Victoria/3/75-like viruses have been characterized from cases in Colorado, Wisconsin, and Missouri. All other influenza virus isolates thus far characterized at the WHO Collaborating Center, CDC, resemble A/Texas/1/77. In Missouri, viruses resembling A/Victoria/3/75 and A/Texas/1/77 were isolated from one population. The simultaneous occurrence of these 2 strains emphasizes the importance of continuing characterization for all H3N2 influenza isolates to determine the relative spread of the 2 variants or to detect new H3N2 variants which might arise.

*References*

1. MMWR 26:400, 1977
2. MMWR 26:408, 1977

**Erratum to ACIP DTP Statement, Vol. 26, No. 49**

p 402 In the Recommendation of the Public Health Service Advisory Committee on Immunization Practices, "Diphtheria and Tetanus Toxoids and Pertussis Vaccine," point "1)" under paragraph 1 of the section, "DIPHTHERIA ANTITOXIN FOR CASE CONTACTS," should read as follows: "1) prompt prophylaxis using either an intramuscular injection of *benzathine penicillin (600,000 units for persons less than 6 years of age and 1,200,000 units for those 6 years of age and older)* or a 7-day course of oral erythromycin with bacteriologic cultures before and after treatment, . . ."

*Volume 27, No. 1 will contain the statistical tables I-IV for week ending December 31, 1977. Upon request, these tables may be obtained as a separate insert for binding with Volume 26.*

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