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LOUISIANA MORBIDITY REPORT

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INFLUENZA HIGH RISK IMMUNIZATION PROGRAM 1988-89

On October 31, 1988 health clinics throughout the State will kick off their flu immunization campaign to individuals who are at high risk of serious illness or death from influenza infection and persons 65 years of age and older.

The influenza immunization program will be limited to these two target groups as specified by the Centers for Disease Control. Physicians, nurses and other personnel who have patient contact should be vaccinated against the flu, due to the potential risk for introducing influenza to high risk groups such as patients with severely compromised cardiopulmonary or immune system or infants in neonatal intensive care units. The Health Department does not have a sufficient amount of vaccine to immunize this group of otherwise healthy individuals.

Influenza strains anticipated to be prevalent in 1988-89 flu season will be closely related to A/Taiwan/1/86 (H1N1), A/Sichuan/2/87 (H3N2), and B/Victoria/2/87. These are the strains included in the vaccine this year.

Health care institutions are encouraged to develop their own immunization programs.

Physicians are encouraged to administer vaccine to any person who wishes to reduce their chance of acquiring influenza infection. Also vaccination programs for persons who provide essential community services are recommended.

Questions concerning the influenza immunizations program may be directed to the respective parish health unit or to the Immunization Section at (504) 568-5007.

* Prevention and Control of Influenza

These recommendations update information on the vaccine and antiviral agent available for controlling influenza during the 1988-89 influenza season (superseding MMWR 1987; 36:373-80,385-7). Changes include statements about 1) updating of the influenza strains in the trivalent vaccine for 1988-89, 2) increased emphasis on the need for vaccination of health-care workers, 3) prevention of influenza in persons with human immunodeficiency virus (HIV) infection, and 4) dosage considerations for amantadine.

INTRODUCTION

Influenza A viruses are classified into subtypes on the basis of two antigens: hemagglutinin (H) and neuraminidase (N). Three subtypes of hemagglutinin (H1, H2, H3) and two subtypes of neuraminidase (N1, N2) are recognized among influenza A viruses that have caused widespread human disease. Immunity to these antigens, especially the hemagglutinin, reduces the likelihood of infection and the severity of disease if infection occurs. However, over time there may be enough antigenic variation (antigenic drift) within the same subtype that infection or vaccination with one strain may not induce immunity to distantly related strains of the same subtype. Although influenza B viruses have shown more antigenic stability than influenza A viruses, antigenic variation does occur. For these reasons, major epidemics of respiratory disease caused by new variants of influenza continue to occur. The antigenic characteristics of current strains provide the basis for selecting virus strains included in each year's vaccine.

Typical influenza illness is characterized by abrupt onset of fever, sore throat, and nonproductive cough. Unlike many other common respiratory infections, it can cause extreme malaise lasting several days. More severe illness can result if influenza virus invades the lungs (primary viral pneumonia) or if secondary bacterial pneumonia occurs. High attack rates of acute illness and lower-respiratory-tract complications during influenza epidemics usually result in dramatic increases in visits to physicians' offices, walk-in clinics, and emergency rooms by persons of all ages.

Elderly persons and those with underlying health problems are at increased risk for complications of influenza infection. Such high-risk persons are more likely than the general population to require hospitalization if infected. One recent study showed that, during major epidemics, hospitalization rates for high-risk adults increased twofold to fivefold, depending on age group. Previously healthy children and younger adults occasionally are hospitalized for influenza-related complications, but the relative increase in their hospitalization rates is much less than that for high-risk groups.

A significant increase in mortality further indicates the impact of influenza epidemics. This increase is a direct result not only of pneumonia, but also of cardiopulmonary or other chronic diseases that can be exacerbated by influenza infection. Ten thousand or more excess deaths have been documented in each of 19 different epidemics during the years 1957-1986; more than 40,000 excess deaths occurred in each of several recent epidemics. Approximately 80%-90% of the excess deaths attributed to pneumonia and influenza were among persons ≥ 65 years of age; however, influenza-associated deaths have also been reported among children or previously healthy adults < 65 years of age during major epidemics.

Because the proportion of elderly persons in the U.S. population is increasing, and because age and its associated chronic diseases are risk factors for severe influenza illness, the toll from influenza can be expected to increase unless control measures are used more vigorously. The number of younger persons at high risk for infection-related complications is also increasing for various reasons, such as the success of neonatal intensive-care units, better management of diseases such as cystic fibrosis, better survival rates for organ-transplant recipients, and the spread of HIV infection.

OPTIONS FOR THE CONTROL OF INFLUENZA

Two measures are available in the United States to reduce the impact of influenza: immunoprophylaxis with inactivated (killed-virus) vaccine and chemoprophylaxis or therapy with the antiviral drug amantadine. *Vaccination of high-risk persons each year before the influenza season is the single most important measure for reducing the impact of influenza.* Vaccination can be highly cost-effective 1) when it is aimed at individuals who experience the most severe consequences and who have a higher-than-average risk of infection and 2) when it is administered to high-risk individuals during routine health-care visits before the influenza season, making special visits to physicians' offices or

* Reprint from MMWR, Centers for Disease June 17, 1988, Vol. 35,
No. 15, pp. 361-364, 369-373

clinics unnecessary. Recent reports indicate that, when there is a good match between vaccine and epidemic strains of virus, achieving high vaccination rates in closed populations can reduce the risk of outbreaks by inducing herd immunity. When outbreaks of influenza A do occur in closed populations, they can be stopped by chemoprophylaxis for all residents.

Other indications for prophylaxis (whether with vaccine or amantadine) include the strong desire of any person to avoid an influenza infection, reduce the severity of disease, or reduce the chances of transmitting influenza to high-risk persons with whom they have frequent contact. Unlike vaccine, which protects against influenza types A and B, amantadine is effective only against influenza A.

Amantadine therapy is most likely to benefit persons who seek medical attention shortly after the abrupt onset of an acute respiratory infection during an influenza A epidemic. Early amantadine therapy may reduce the severity and duration of illness in high-risk individuals who have not been vaccinated or who were not protected by vaccination.

Influenza is known to be transmitted in medical settings. Measures such as using isolation precautions for ill patients individually or in groups, limiting visitors, and avoiding elective admissions and surgery during an influenza outbreak may limit further transmission of virus within hospitals and other institutions. However, unlike amantadine prophylaxis, these measures have not been shown to be effective in controlling outbreaks. Likewise, the effectiveness of closing schools or classrooms during explosive outbreaks has not been established.

INACTIVATED VACCINE FOR INFLUENZA A AND B

Influenza vaccine is made from highly purified, egg-grown viruses that have been rendered noninfectious (inactivated). Most vaccines distributed in the United States have been chemically treated (split-virus preparations) to reduce the incidence of febrile reactions in children. Influenza vaccine currently contains three virus strains (two type A and one type B) representing influenza viruses recently circulating worldwide and believed likely to circulate in the United States the following winter. The potency of the present vaccine is such that it causes minimal systemic or febrile reactions. Most vaccinated young adults develop hemagglutination-inhibition antibody titers that are likely to protect them against infection by strains like those in the vaccine and, often, by related variants that may emerge. Elderly persons and persons with certain chronic diseases may develop lower postvaccination antibody titers than healthy young adults and, thus, may be more susceptible to upper-respiratory-tract infection. Nevertheless, influenza vaccine can still be effective in preventing lower-respiratory-tract involvement or other complications, thereby reducing the risk of hospitalization and death.

RECOMMENDATIONS FOR USE OF INACTIVATED INFLUENZA VACCINE

Influenza vaccine is recommended for 1) high-risk persons ≥ 6 months of age and their medical-care providers or household contacts; 2) children and teenagers receiving long-term aspirin therapy who, therefore, may be at increased risk of developing Reye syndrome after an influenza virus infection; and 3) other persons who wish to reduce their chances of acquiring influenza. Vaccine composition and dosages for the 1988-89 season are given in Table 1. Guidelines for the use of vaccine among different groups are given below.

Remaining 1987-88 vaccine should not be used.

Although the current influenza vaccine often contains one or more antigens used in previous years, immunity declines in the year following vaccination. Therefore, annual vaccination is required.

During the past decade, data on influenza vaccine immunogenicity and side effects have generally been obtained when vaccine has been administered intramuscularly. Because there has been no adequate evaluation of recent influenza vaccines administered by other routes, the intramuscular route should be used. Adults and older children should be vaccinated in the deltoid muscle, and infants and young children, in the anterolateral aspect of the thigh.

TARGET GROUPS FOR SPECIAL VACCINATION PROGRAMS

Groups at greatest risk of influenza-related complications:

- 1) Adults and children with chronic disorders of the pulmonary or cardiovascular systems requiring regular medical follow-up or hospitalization during the preceding year, including children with asthma.
- 2) Residents of nursing homes and other chronic-care facilities housing patients of any age with chronic medical conditions.

Groups at moderate risk of influenza-related complications:

- 1) Otherwise healthy persons ≥ 65 years old.
- 2) Adults and children who have required regular medical follow-up or hospitalization during the

preceding year because of chronic metabolic diseases (including diabetes mellitus), renal dysfunction, hemoglobinopathies, or immunosuppression.

- 3) Children and teenagers (aged 6 months–18 years) who are receiving long-term aspirin therapy and, therefore, may be at risk of contracting Reye syndrome after an influenza infection.

Groups potentially capable of nosocomial transmission of influenza to high-risk persons. Individuals attending high-risk persons can transmit influenza infections to them while they are themselves incubating infection, undergoing subclinical infection, or working despite the existence of symptoms. Some high-risk persons (e.g., the elderly, transplant recipients, or persons with acquired immunodeficiency syndrome [AIDS]) can have relatively low antibody responses to influenza vaccine. Efforts to protect them against influenza may be improved by reducing the chances that their care providers may expose them to influenza. Therefore, the following groups should be vaccinated:

- 1) Physicians, nurses, and other personnel who have extensive contact with high-risk patients (e.g., primary-care and certain specialty clinicians and staff of chronic-care facilities and intensive-care units, particularly neonatal intensive-care units).
- 2) Providers of home care to high-risk persons (e.g., visiting nurses, volunteer workers) as well as all household members of high-risk persons, including children, whether or not they provide care.

VACCINATION OF OTHER GROUPS

General Population: Physicians should administer influenza vaccine to any person who wishes to reduce his/her chances of acquiring influenza infection. Persons who provide essential community services may be considered for vaccination to minimize the disruption of essential activities during severe epidemics.

Pregnant Women: Pregnancy has not been shown to be a risk factor for severe influenza infection, except in the largest pandemics of 1918–19 and 1957–58. However, pregnant women who have medical conditions that increase their risks of complications from influenza should be vaccinated, as the vaccine is considered safe for pregnant women. Administering the vaccine after the first trimester

TABLE 1. Influenza vaccine* dosage, by age of patient — 1988–89 season

Age Group	Product [†]	Dosage [‡]	Number of Doses	Route [§]
6–35 mos	Split virus only	0.25 mL	1 or 2**	IM
3–12 yrs	Split virus only	0.50 mL	1 or 2**	IM
>12 yrs	Whole or split virus	0.50 mL	1	IM

*Contains 15 µg each of A/Taiwan/1/86 (H1N1), A/Sichuan/2/87 (H3N2), and B/Victoria/2/87 hemagglutinin antigens in each 0.5 mL. Manufacturers include Connaught (Fluzone[®] whole or split, distributed by E.R. Squibb & Sons); Parke-Davis (Fluogen[®] split); and Wyeth Laboratories (Influenza Virus Vaccine, Trivalent[®] split). For further product information, call Connaught (800)822-2463, Parke-Davis (800)223-0432, and Wyeth (800)321-2304.

[†]Because of the lower potential for causing febrile reactions, only split virus (subvirion) vaccine should be used in children. Immunogenicity and side effects of split and whole virus vaccines are similar in adults when vaccines are used according to the recommended dosage.

[‡]It may be desirable to administer influenza vaccine to high-risk children when they receive routine pediatric vaccines, but in a different site. Although studies have not been conducted, simultaneous administration should not lessen immunogenicity or enhance adverse reactions.

[§]The recommended site of vaccination is the deltoid muscle for adults and older children. The preferred site for infants and young children is the anterolateral aspect of the thigh.

**Two doses are recommended for children < 12 years old who are receiving influenza vaccine for the first time.

is a reasonable precaution to minimize any concern over the theoretical possibility of teratogenicity. However, it is undesirable to delay vaccination of pregnant women with high-risk conditions who will still be in the first trimester of pregnancy when the influenza season begins.

Persons infected with human immunodeficiency virus (HIV): Increases in infections and complications caused by various respiratory pathogens have been observed in persons infected with HIV. However, similar increases due to influenza have not been reported during recent epidemics. Nevertheless, because influenza may result in serious illness and complications in some HIV-infected persons, vaccination is a prudent precaution.

PERSONS WHO SHOULD NOT BE VACCINATED

Inactivated influenza vaccine should not be given to persons who have an anaphylactic hypersensitivity to eggs (see *Side Effects and Adverse Reactions* below). Persons with acute febrile illnesses normally should not be vaccinated until their temporary symptoms have abated.

TIMING OF INFLUENZA VACCINATION ACTIVITIES

Influenza vaccine should be offered beginning in September. Except in years of pandemic influenza (e.g., 1957 and 1968), high levels of influenza activity generally do not occur in the contiguous 48 states before December. Therefore, organized vaccination campaigns where high-risk persons are routinely accessible are *optimally* undertaken in November. In facilities such as nursing homes, it is particularly important to avoid administering vaccine too far in advance of the influenza season because antibody can begin to decline within a few months. Such vaccination programs may be undertaken in September or October if regional influenza activity is expected to begin earlier than normal.

Children ≤ 12 years of age who have not been vaccinated previously require two doses with at least 1 month between doses. The second dose should be given before December. Vaccine can be given to both children and adults up to and even after influenza virus activity is documented in a region.

STRATEGIES FOR IMPLEMENTING INFLUENZA VACCINE RECOMMENDATIONS

More effective programs are needed for giving influenza vaccine to high-risk persons, their health-care providers, and their household contacts. Programs for administering vaccine in nursing homes and other chronic-care facilities, physicians' offices, health maintenance organizations, hospitals, and employee health clinics must be carefully planned. High-risk adults and children who do not live in nursing homes or other chronic-care facilities should be offered influenza vaccine at their last regular medical appointment before the influenza season (i.e., before December). If they do not have a regular medical appointment scheduled in the fall, they should be notified by their health-care providers to come in specifically to receive influenza vaccine. From September through February, hospital discharge procedures should include influenza vaccination of high-risk patients. Medical-care personnel and support staff should ensure that no high-risk patient resides in or leaves a medical-care facility in the fall without being offered and urged to receive influenza vaccine. Equally important, administrators and infection-control staff of health-care facilities should establish procedures for offering vaccine to patient-care staff that take into account barriers to vaccination. More staff members will be vaccinated if vaccine is readily available at the worksite (e.g., on patient-care units during all shifts rather than at an employee health clinic).

Educational materials about influenza and its control are available from a variety of sources. For information on sources of educational materials and a selected bibliography, contact the Centers for Disease Control, Center for Prevention Services, Technical Information Services, 1600 Clifton Road, N.E., Atlanta, Georgia 30333.

SIDE EFFECTS AND ADVERSE REACTIONS

Because influenza vaccine contains only noninfectious viruses, it cannot cause influenza. Occasional cases of respiratory disease following vaccination represent coincidental illnesses unrelated to influenza vaccination. The most frequent side effect of vaccination is soreness around the vaccination site for up to 1 or 2 days; this occurs in less than one-third of vaccinees.

In addition, the following two types of systemic reactions have occurred:

- 1) Fever, malaise, myalgia, and other systemic symptoms occur infrequently and most often affect persons who have had no exposure to the influenza virus antigens in the vaccine (e.g., young children). These reactions begin 6–12 hours after vaccination and can persist for 1 or 2 days.
- 2) Immediate, presumably allergic, reactions such as hives, angioedema, allergic asthma, or systemic anaphylaxis occur extremely rarely after influenza vaccination. These reactions probably result from hypersensitivity to some vaccine component—most likely residual egg protein. Although current influenza vaccines contain only a small quantity of egg protein, they are presumed capable of inducing immediate hypersensitivity reactions in persons with severe egg allergy, and such persons should not be given influenza vaccine. This includes persons who develop hives, have swelling of the lips or tongue, or experience acute respiratory distress or collapse after eating eggs. Persons with a documented immunoglobulin E (IgE)-mediated hypersensitivity to eggs, including those who have experienced occupational asthma or other allergic responses from occupational exposure to egg protein, may also be at increased risk of reactions from influenza vaccine.

Unlike the 1976 swine influenza vaccine, subsequent vaccines prepared from other virus strains have not been associated with an increased frequency of Guillain-Barré syndrome. Although influenza vaccination can inhibit the clearance of warfarin and theophylline, clinical studies have consistently failed to show any adverse effects attributable to these drugs in patients receiving influenza vaccine.

**SIMULTANEOUS ADMINISTRATION OF OTHER VACCINES,
INCLUDING CHILDHOOD VACCINES**

The target groups for influenza and pneumococcal vaccination overlap considerably. Both vaccines can be given at the same time at different sites without increasing side effects. However, influenza vaccine is given annually, and it is currently recommended that pneumococcal vaccine be given only once. Detailed immunization records should be provided to each patient to record the date when pneumococcal vaccine was given.

High-risk children usually see a health professional to receive routine pediatric vaccines. These visits provide a good opportunity to administer influenza vaccine simultaneously but in a different site. Although studies have not been conducted, simultaneous administration should not diminish immunogenicity or increase adverse reactions.

ANTIVIRAL AGENTS FOR INFLUENZA A

Two antiviral drugs have specific activity against influenza A viruses: amantadine hydrochloride and rimantadine hydrochloride. Currently, only amantadine is approved for marketing in the United States.

Both amantadine and rimantadine interfere with the replication cycle of type A influenza viruses, although the specific mechanisms of their antiviral activity are not completely understood. Both drugs are 70%–90% effective in preventing illnesses caused by naturally occurring strains of type A influenza viruses. However, they are not effective against type B influenza. When administered within 24–48 hours after the onset of illness, they can reduce the duration of fever and other systemic symptoms, allowing the patient to return more rapidly to routine daily activities. Since these drugs may not prevent infection itself, persons who take them can still develop immune responses that will protect them when they are subsequently exposed to antigenically related viruses.

Increasing the availability of rapid viral diagnostic tests and improving the dissemination of information about areas where influenza A virus infections have been confirmed will allow for more efficient and appropriate use of antiviral agents. Such information is reported throughout the influenza season in the *MMWR* and is also available by computer telecommunication through the Public Health Foundation.

AMANTADINE PROPHYLAXIS RECOMMENDATIONS

Amantadine is recommended under certain circumstances, particularly for control of presumed influenza A outbreaks in institutions housing high-risk persons. Chemoprophylaxis should begin as early as possible after the outbreak is recognized. Contingency planning is needed in chronic-care facilities to establish specific steps for rapidly administering amantadine to residents and staff when influenza outbreaks occur. For outbreak control, amantadine should be administered to all residents of the institution whether or not they received influenza vaccine the previous fall. Amantadine should also be offered to unvaccinated staff who provide care to high-risk patients. For prophylaxis, the antiviral drug should be taken each day for the duration of influenza activity in the community.

Amantadine prophylaxis is also recommended in the following situations:

- 1) *As an adjunct to late vaccination of high-risk persons.* It is not too late to vaccinate even when influenza A is known to be in the community. However, because the development of an antibody response following vaccination takes about 2 weeks, amantadine should be used during this period. Amantadine does not interfere with the antibody response to the vaccine.
- 2) *To reduce the spread of infection and to maintain care for high-risk persons in the home.* Unvaccinated persons who provide home care for high-risk persons (e.g., household members, visiting nurses, volunteer workers) should also receive amantadine prophylaxis during the period when influenza A outbreaks occur.
- 3) *For immunodeficient persons.* As a supplement to the protection afforded by vaccination, amantadine prophylaxis is indicated for high-risk patients who may have a poor antibody response to influenza vaccine, such as persons with AIDS. Whereas adults with AIDS can be expected to have some residual immunity to influenza from prior infections, children with AIDS may have little or no immunity to the virus. Therefore, amantadine prophylaxis against influenza should be considered during influenza epidemics, especially for children with AIDS. The potential benefits should be evaluated on a case-by-case basis, taking into account the potential risks of side effects, especially in patients with central nervous system involvement.
- 4) *For persons for whom influenza vaccine is contraindicated* (see *Side Effects and Adverse Reactions* above).

Amantadine can also be used prophylactically in other situations (e.g., for unimmunized members of the general population who wish to avoid influenza A illness). This decision should be made on an individual basis.

AMANTADINE THERAPY

Although amantadine has been shown to reduce the severity and shorten the duration of influenza A illness in healthy adults and children, no well-controlled clinical studies have examined the efficacy of amantadine therapy in preventing complications of influenza A in high-risk persons. Nevertheless, because of the potential benefits, amantadine should be considered for high-risk patients who contract an illness compatible with influenza during a period of known or suspected influenza A activity in the community. The drug should be given within 24-48 hours after onset of illness and should be continued until 48 hours after signs and symptoms resolve.

DOSAGE CONSIDERATIONS FOR AMANTADINE

The following information should be considered in determining the appropriate dosage of amantadine:*

- 1) In controlled studies, 5%-10% of healthy young adults taking amantadine at the standard adult dosage of 200 mg per day have reported side effects including nausea, dizziness, insomnia, nervousness, and impaired concentration. Data suggest that a daily prophylactic dosage of 100 mg may provide protection comparable to that of 200 mg/day but with fewer side effects. No studies have compared the efficacy of amantadine at daily dosages of 100 mg and 200 mg for treatment of influenza A infection.
- 2) Amantadine is not metabolized and is excreted unchanged in the urine by glomerular filtration and tubular secretion. Because renal function declines with aging, the daily dosage for persons ≥ 65 years of age should not exceed 100 mg for prophylaxis or treatment. When amantadine is administered to patients with impaired renal function, the dosage should be further reduced (see package insert). Because recommended dosages for persons with renal impairment provide only a rough estimate of the optimal dosage for a given patient, such individuals should be closely observed so that adverse reactions can be recognized promptly and the dosage reduced or the drug discontinued if necessary.
- 3) Persons with active seizure disorders may be at increased risk for seizures when given amantadine at a dosage of 200 mg daily. Data suggest that the risk of seizures in such persons might be reduced by using a lower dose of the drug.
- 4) The use of amantadine in children <1 year of age has not been adequately evaluated. The approved dosage for children 1-9 years of age is 4.4-8.8 mg/kg/day, not to exceed 150 mg/day. Although further studies would be desirable to determine the optimal dosage for children, physicians should consider prescribing 4.4 mg/kg/day to reduce the risk of toxicity. For children ≥ 10 years weighing <45 kg, it may also be advisable to prescribe 4.4 mg/kg/day. The dose for treatment should not exceed 150 mg for children aged 1-9 years and 200 mg for children ≥ 10 years of age. As for adults, a maximum dosage of 100 mg daily should be effective for prophylaxis (see #1 above).

*Further information is available from DuPont Pharmaceuticals, one of the manufacturers of amantadine, by calling (800)441-9861.

LOUISIANA AIDS UPDATE

	CASES	DEATHS	PERCENT
1988 (thru 8/03/88)	149	48	32
TOTAL, ALL YEARS	944	598	63

TETANUS: Caution in Assessing Immunization History

On May 4, 1988, a 30-month old black male was admitted to a hospital in New Orleans with evidence of tetanus, as demonstrated by generalized contractures with paroxysms, trismus and opisthotonic posturing.

The child had visited the emergency room 5 days before, with a right hand palmar laceration sustained from a piece of glass in his residence's back yard. The wound was debrided and sewn up. No tetanus toxoid or tetanus immune-globulin was administered, because his mother stated that the boy's immunizations were up-to-date. Following his admission with tetanus, further investigation revealed that the child had never received any immunizations, and that the parents had not responded to a notification from the health unit. Three of four siblings, registered under four different home addresses, had incomplete immunization histories.

The course of his hospitalization included drug induced paralysis and mechanical ventilation with tracheostomy for one month, naso-jejunal feeding, gastrointestinal bleeding secondary to oesophagitis, anemia (secondary to GI bleeding and to blood drawing) requiring transfusions, recurrent atelectasia, bilateral femoral deep veinous thrombosis. Despite these complications, the child was doing well and was discharged to physical therapy after a total of 7 weeks.

EDITORIAL NOTE:

Thanks to high immunization coverage and appropriate tetanus prophylaxis during wound management, cases of tetanus are rare and usually affect unimmunized adults or the elderly. In Louisiana, 6 cases were reported in 1986 and 0 in 1987. This rarity may lead us to believe that the risk of tetanus is very low, but this case should remind everyone that the risk of tetanus is real in the absence of immunization.

In a recent survey of immunization status of 2-year-old children in Louisiana, it was found that 1.2% of them had not received any immunizations at all. Immunization coverages of 98% and above are highly satisfactory for contagious diseases transmitted from person to person, because lack of transmission in a largely immunized population also protects those few who are not immunized from being exposed to the disease. This phenomenon is referred to as "herd immunity."

Tetanus is not a contagious disease. Any unimmunized person is at risk of acquiring tetanus regardless of the immunization coverage of the community.

In Louisiana, we estimate that 370 to 1100 children between 2 and 5 years of age go without any protection, until they hopefully get immunized at time of entering school. For nursing and medical personnel dealing with wound management, this means that unimmunized children are likely to visit hospitals and other health care facilities for wound care. Proper attention should be paid to assessing immunization status and verbal histories taken with caution. When history of complete immunization is uncertain, provider-verified history or written documentation of past immunizations should be obtained OR tetanus immune globulin and/or tetanus toxoid (1) be administered as appropriate.(2,3)

1. DTP, DT or TD, according to age.
2. Tetanus. "Control of Communicable Diseases in Man", A.S. Benenson. APHA, 1985, p 384-388.
3. Tetanus. "Red Book", American Academy of Pediatrics, 1986, p. 355-359.

Recommendations for Management of HIV Infection and Acquired Immunodeficiency Syndrome

Acquired Immunodeficiency Syndrome (AIDS) should be regarded as a major health care concern. It is an infectious disease which is generally widespread, incurable, and misunderstood. The fear of AIDS is often disproportionate to the risk of acquiring the disease.

AIDS is a disease caused by the human immunodeficiency virus (HIV), formerly called the human T-lymphotropic virus type III/lymphadenopathy-associated virus (HTLV-III/LAV). HIV infects the lymphocytes. The body substances containing the greatest amount of virus are blood, semen, and vaginal secretions. The virus is transmitted through sexual contact, percutaneous exposure, perinatal exposure, by absorption through mucous membranes, and through nonintact mucous membranes and skin. It is not spread through ordinary social, occupational, or household contacts of a nonsexual nature.

In the health care setting, the risk of acquiring or transmitting HIV infection by patients or health care workers (HCW) is related to the degree of percutaneous contact or mucous membrane contamination with blood or other high-risk body substances. The same precautions used to prevent transmission of hepatitis B virus (HBV) are adequate to prevent the spread of HIV, as it is less hardy and is present in fewer numbers than the HBV.

PURPOSE

The following recommendations for the management of AIDS were developed to promote standardization and improvement of AIDS management in the community. These recommendations provide a consolidation and summary of important topics, clarification or resolutions for some controversial issues, and a list of the most significant references (1-17). As such, the recommendations are not meant to be all inclusive, but must be used in combination

with the listed references. This document should be useful to agencies developing AIDS policies, procedures, and protocols. Although these guidelines were written by the Austin Area Infection Control Committee, they are applicable to all states.

I. AIDS PROGRAMS FOR HEALTH CARE AGENCIES

- A. Each health care agency should develop an agency-specific AIDS program based on these recommendations and references.
- B. The program should include written policies, procedures, and protocols.
- C. The major focus of the program should be to educate employees about the disease and its transmission in order for them to respect, but not fear, the disease. This will maximize their ability to rationally provide effective patient care.
- D. A multidisciplinary committee should be formed to develop, implement, and evaluate the AIDS program and to serve as educators and consultants for AIDS-related issues.

II. UNIVERSAL BLOOD AND BODY SUBSTANCE PRECAUTIONS

- A. Universal blood and body substance precautions should be promptly implemented for ALL patients. There are no additional precautions for patients with communicable bloodborne disease, including patients with AIDS, patients with HIV-positive blood and patients under going diagnostic work-ups for AIDS. 5, 8,14,15.
 1. All body substances from any individual

should be considered infectious because every individual is a potential disease carrier, and the undiagnosed case represents the greatest risk of transmission.

2. If the patient has other infections that require additional precautions, these precautions also should be implemented following CDC guidelines. 8
- B. Hands should be washed routinely after care of the patient and immediately if soiled with blood or body fluids. Note the handwashing is the only precaution necessary for many patient contacts. 14,15.
- C. Gloves are recommended for all direct contact with blood or body substance or with items soiled with such. This is especially important if the HCW has fresh cuts or breaks in the skin. Note that gloves are an adjunct, not a substitute, for handwashing. 14,15.
 1. Reusable, rubber, household or janitorial gloves are recommended for cleaning spills involving blood and other substances. A 10% (1:10) solution of sodium hypochloride, prepared by combining one part household bleach with nine parts water, may be used as a disinfectant. Alcohol (70%) and other common hospital disinfectants are also effective against the virus.
- D. Needles and sharps should be handled with extreme care and with minimal manipulation to prevent accidental punctures. Do not recap, bend, break, or remove needles from syringes. 8,14,15. The unsheathed needle and syringe should be placed directly into a labeled, rigid, puncture resistant container which is located as close as possible to the area where it is used, preferably in the patient's room.
- E. Gowns are recommended only if soiling

with a body substance is likely. 8,14,15.

- F. Masks and goggles should be available for use wherever aerosolization or splattering of a body substance is likely, e.g., delivery rooms, operating rooms, emergency rooms, endoscopy rooms, pathology and other laboratories, code carts, wound irrigation areas, etc. 14,15 (See Section III.).
- G. For isolation purposes, a private room is not usually necessary, and patients need not be restricted to their rooms. Exceptional conditions are patients with poor hygiene, patients who are uncooperative, or patients who present risk of dispersing aerosols or splatters of body substances into the environment. 8,14,15.
- H. Resuscitation equipment (including bags and airway pieces for connection to bags) should be strategically placed and readily available. HCWs should be trained in CPR classes to the use of resuscitation equipment. 14,15.
 1. All laboratory specimens should be placed in leak-proof containers which are uncontaminated on the outside. The use of a bag for specimens is optional. 8
- J. Infective wastes (microbiology waste, pathology waste, blood and blood products, and contaminated sharps), in general, should be incinerated or autoclaved before disposal in a sanitary landfill. Bulk blood, suctioned fluids excretions, and secretions may be carefully poured down a drain connected to a sanitary sewer. For disposal of needles and sharps, see Section II, D.

The Louisiana State regulations governing infectious waste management are currently under revision. Therefore, there may be changes in the future.

K. After death, bodies of persons with AIDS, HIV infection, or certain other reportable communicable diseases must be Tagged.

III. PRECAUTIONS DURING OPERATIVE, OBSTETRICAL, DENTAL, OR OTHER INVASIVE PROCEDURES AND TRAUMA CARE

A. HCWs who perform or assist in invasive procedures must follow the precautions listed below that are directed at preventing the transmission of any bloodborne disease between HCWs and clients. 13,15.

B. Appropriate precautions listed in Section II should be followed during invasive procedures, with special attention to handwashing, gloving, use of other barrier precautions (gowns, masks, goggles) when excess soiling or splattering potential exists. 13,15

C. Gloves must be worn when touching mucous membranes or nonintact skin of patients. If gloves are torn or a needlestick or other injury occurs, the gloves must be changed, the contaminated needle or instrument must be removed from the field, and the site of injury must be cleaned vigorously as promptly as possible. 13,15

D. HCWs should promptly report any inadvertent exposure of a patient to the blood of a HCW or exposure of a HCW to the blood of a patient during an invasive procedure. 13,15 (See Section).

E. HCWs with evidence of any illness that might compromise their ability to adequately and safely perform invasive procedures should be evaluated medically to determine whether they are physically and mentally competent to perform invasive procedures. Note that a confirmed positive HIV antibody test alone, just as it is for HBV

carriers, is not a contraindication to performing or assisting with invasive procedures. 13,15.

F. All HCWs who perform or assist in invasive procedures must be educated in the appropriate precautions to prevent the transmission of HIV and other bloodborne diseases, including hepatitis B. 13, 15 Suggested methods of education include the use of written handouts delineating desired practices, annual follow-up, and documentation of HCWs knowledge and agreement to follow precautions.

IV. PRECAUTIONS FOR OTHER DEPARTMENTS AND SERVICES

A. Other departments and services can safely provide care to AIDS/HIV clients by adopting and following the recommendations and references in this document. Specific references for specialty areas are listed below:

1. Ambulatory care services 1
2. Clinical laboratories 4,15
3. Educational and child-care services 7
4. Eye labs and eye treatment services 12
5. Home-care services
6. Long-term care facilities 15,
7. Oral surgery and dental units 3,13,14,15
8. Perinatal departments 3,11
9. Personal-service workers 14
10. Prehospital emergency health care services 14
11. Dialysis units 15

B. Food services should follow recommended standards and practices of good personal hygiene and sanitation. There is no evidence that HIV is spread through food or water; thus, no special precautions are indicated for dishes, and food-service personnel should not be restricted in their work because of serum antibodies to HIV (positive HIV test). 14

C. Routine sterilization, disinfection, housekeeping, and waste disposal procedures recommended for use in hospitals are more than adequate to prevent the transmission of HIV. 14,15

V. PATIENT CONFIDENTIALITY

A. On admission of a patient with a confirmed diagnosis of AIDS, spell out "acquired immunodeficiency syndrome"; avoid the abbreviated "AIDS" label.

B. On admission of a patient whose admitting diagnosis is not confirmed, list actual symptoms or conditions and promptly place the patient on appropriate precautions for other associated communicable diseases as indicated. Do not use R/O AIDS, pre-AIDS, or ARC as an admitting diagnosis.

C. Promote confidentiality for AIDS patients without compromising the safety of HCWs by ensuring that proper precautions are clearly understood but without discriminatory label. (1)

D. No departmental or computerized lists of AIDS or HIV antibody-positive patients should be permitted. In addition to violating patient confidentiality, such lists may promote inappropriate techniques and false security in HCWs who should follow appropriate blood and body substance precautions with ALL patients.

E. Requirements for reporting confirmed AIDS cases to the local health authority in a confidential manner can be obtained from local health departments or the AIDS Division at the Louisiana Department of Health, Epidemiology Section (504) 568-5005. Request form number CDC 50.42A (Revised 8/87).

F. Reporting of any infectious disease which has serious social or legal

ramifications should not be available via computer. Thus, when HIV testing is done, confirmed results should be reported directly to the medical record. A computer entry regarding HIV testing might be "HIV test—results pending" or "HIV test—Check medical record for results".

G. Confidential test results should only be released by telephone to the physician or his/her agent, charge nurse, infection control practitioner, or other specific individuals as defined by infection control policy. When telephone reports are given, the reporter should take appropriate precautions and be absolutely sure of the identity of the caller and his/her right to receive the information.

H. Make certain the ICD-9 codes on the front of each patient's chart are well-founded and accurate.

VI. HIV ANTIBODY AND ANTIGEN TESTING

A. The presence of demonstrated antibody to HIV is considered an indication that infection is present and the potential to transmit the virus exists.

B. The ELISA test is currently recommended for initial HIV antibody testing. The Western Blot test should be used to confirm repeatedly positive ELISA tests. New and improved antibody and antigen tests may replace these in the future.

C. There should be no mandatory HIV antibody screening, except for the screening of donated blood or other tissues or organs, specifically defined by Louisiana Board of Health guidelines.

D. Each agency should develop policies for HIV antibody testing of patients, specifying any agency-unique requirements for consent and confidentiality. The

following guidelines are suggested;

1. Patient consent for HIV antibody testing as an adjunct to diagnosis is recommended. The consent may be the original signed permit for care or a specific verbal or written consent for testing.
2. HIV antibody test results on patients should be placed in the patient's medical record, but results should not be accessible by computer. Preliminary results from screening tests should not be placed on charts until confirmed, but should be reported to the patient's physician and the Infection Control Practitioner and/or charge nurse. (See Section V)
3. HIV antibody test results should be handled with the utmost confidentiality. Telephone reports should be avoided whenever possible. If used, precautions, as described in Section V, G, should be followed.

VII. MANAGEMENT OF ACCIDENTAL EXPOSURE TO BLOOD/BODY SUBSTANCES

- A. All exposures of HCWs or clients to body substances should be reported promptly by the HCW, following agency-specific practices. 14,15, Exposure is defined as parenteral (needlestick or other penetrating puncture the skin with a used needle or other), mucous membrane (splatter/aerosols into the eyes, nose, or mouth), or significant contamination of an open wound or nonintact skin with a body substance.
- B. General Recommendations
 1. It is the right and responsibility of the agency to protect the health of the employees and patients and to properly inform them of the risk of significant infection to which they are exposed for both ethical and legal reasons.

2. Agency-specific protocols should be developed for post-exposure management that clearly specify procedures for determining the need for testing, assuring confidentiality, and specifying individual responsibility and authority and that respect both the person with the infection and the person who might be exposed to the infection. Responsibility for post-exposure management (including assessments, determining risks, counseling, and record keeping) should be clearly delegated to the Infection Control Practitioner, Infection Control Committee Chair, or other authorized person.
3. The following recommendations for HIV exposure are the same in principle as for other potentially infectious disease exposures:
 - a. When indicated, post-exposure HIV antibody testing of both the source and the exposed individual is strongly recommended.
 - b. If an employee refuses HIV antibody testing, the agency may ask that the employee sign a statement that testing was offered to the employee who refused.
 - c. The source person and his physician should be informed of the incident, be made knowledgeable of the procedures, (including those which describe how confidentiality is maintained), and concur with the need for testing. Postexposure HIV antibody test results on patients should be handled according to the hospital policies for maintaining confidential records (See Section VI,D). For example, the results may be placed in the medical record only with patient consent or remain a confidential infection control record.
 - d. Post-exposure HIV antibody test results on employees may be placed on the Employee Health Record only if it is kept separate from the personnel files

and is handled as highly confidential; otherwise, it should remain a confidential infection control record.

C. Protocols for post-exposure management should be based on the following procedural guidelines and coordinated with the attending physician.

1. The source individual should be assessed clinically and epidemiologically to determine the risk or likelihood of HIV, HBV, or other blood-transmissible infections.
2. The attending physician and the source patient (or legal representative if the individual is temporarily or otherwise incompetent) should be informed of the exposure, understand that the test results will be kept confidential, and concur with the need for testing. (See Section VII, B,3,c)
3. If the source has no clinical evidence of infection, is HIV antibody-negative, and has no history of high-risk behavior, no further follow up of source or exposed individual is indicated.
4. If the source has evidence of possible HIV infection, a confirmed positive HIV antibody test, a history of high-risk behavior, cannot be tested, or refuses to be tested, then:
 - a. The exposed individual should be evaluated clinically for evidence of HIV infection, and HIV antibody testing should be recommended as soon as possible after the exposure. Refusal to submit a specimen should be documented. (See Section VII, B, 3, b)
 - b. If the exposed individual's baseline test is negative for antibody, he or she should have testing for HIV antibody approximately eight weeks following exposure. Most seroconversions occur within 6-12 weeks. Additional testing no later than six months following exposure may be done based on the individual's need to know and the risk

of exposure to others. Upon request, some institutions will test employees a year following exposure.

- c. Both the source and the exposed individual should be counseled. 9
- d. The Louisiana legislature recently approved a bill allowing institutions in unusual circumstances in an occupational exposure to test the blood of a patient for HIV without the patient's consent. This is on the condition a sample of the patient's blood is already available in the laboratory. The results of the test shall not become part of the patient's medical record and shall be confidential.
5. Post-exposure counseling should be given within two weeks of exposure and should include information on the potential risk of infection and specific measures to prevent transmission. 9,10,14, 15.

VIII. EMPLOYMENT ISSUES

- A. All HCWs, as indicated by their job descriptions, are expected to care for patients with all communicable diseases, including AIDS.
 1. Pregnant HCWs, should not be exempt from caring for AIDS patients because they are not at increased risk of acquiring AIDS, and the recommended precautions are uniformly effective. 14 15
 2. Physician prescription for exemption of pregnant HCWs are incompatible with scientific evidence and published guidelines. 14,15
- B. HCWs with AIDS or positive HIV antibody tests should be hired and/or retained in their jobs based on their ability to perform the job adequately and safely and on their willingness to follow standard infection control policies and procedures.

C. Alternative assignments or transfers of HCWs with AIDS or positive HIV antibody tests are rarely indicated and should be used only if a consistent, nondiscriminatory policy is developed and followed as for HBV infection. (See Section III, B, E, and F,)

D. Agencies should develop specific policies or counseling and education of HCWs with known infectious agents which have a low risk of potential transmission, including HIV infections. This review should emphasize precautions for preventing the transmission of their potentially infectious disease, in this case, HIV or its associated opportunistic infections. 13,14,15

IX. NOTIFICATION OF RECIPIENTS OF CONTAMINATED BLOOD PRODUCTS

A. Agencies that give blood products should develop a program for notifying recipients of contaminated blood products following the American Hospital Association's "Look Back" program.²

REFERENCES:

1. AHA Advisory Committee on Infections Within Hospitals. Management of HTLV-III/LAV infections in the hospital. American Hospital Association. January 1986.
2. American Hospital Association. Look Back program: notification of previous recipients of blood and blood components from donors who now have a confirmed positive test for antibodies to the HTLV-III virus. Memorandum.
3. CDC. ACIP: recommendations for protection against viral hepatitis. MMWR 1985; 34:313-35.
4. CDC. AIDS: precautions for clinical laboratory staffs. MMWR 1982; 31:577-80.

5. CDC. AIDS: precautions for health-care workers and allied professions. MMWR 1983;32: 450-1.

6. CDC. Classification systems for HTLV-III/LAV infections. MMWR 1986; 35: 334-9.

7. CDC. Education and foster care of children infected with HTLV - III/ LAV. MMWR 1985; 34:517-21.

8. CDC. Guideline for isolation precautions in hospitals. Washington DC. US Government Printing Office, 1983 (DHHS publication no. (CDC) 83- 8314).

9. CDC. Public Health Service guidelines for counseling an antibody testing to prevent HIV infection and AIDS. MMWR 1987;36:509-15.

10. CDC. Provisional Public Health Service interagency recommendations for screening donated blood plasma for antibody to the virus causing acquired immunodeficiency syndrome. MMWR 1985; 34:1-5

11. CDC. Recommendations for assisting in the prevention of perinatal transmission of HTLV-III/LAV and AIDS MMWR 1985; 34:721-6, 731-2

12. CDC. Recommendations for preventing possible transmission of HTLV-III/LAV from tears. MMWR 1985; 34: 533-4.

13. CDC. Recommendations for preventing transmission of infection with HTLV-III/LAV during invasive procedures. MMWR 1986;35:221-3

14. CDC. Recommendations for preventing transmission of infection with HTLV-III/LAV. in the workplace. MMWR 1985; 34:682-6, 691-5.

15. CDC. Recommendations for prevention of HIV transmission in health-care settings. MMWR 1987; 36:3S-18S.

Continued on back cover

SELECTED REPORTABLE DISEASES

(By Place of Residence)

STATE AND PARISH TOTALS	VACCINE PREVENTABLE DISEASES					ASEPTIC MENINGITIS	HEPATITIS A AND UNSPECIFIED	HEPATITIS B	LEGIONELLOSIS	MALARIA	MENINGOCOCCAL INFECTIONS	SHIGELLOSIS	TUBERCULOSIS, PULMONARY	TYPHOID FEVER	OTHER SALMONELLOSIS	UNDERNUTRITION SEVERE	GONORRHEA	SYPHILIS, PRIMARY AND SECONDARY	RABIES IN ANIMALS (PARISH TOTALS CUMULATIVE 1988)
	MEASLES	RUBELLA	MUMPS	PERTUSSIS	TETANUS														
TOTAL TO DATE 1987	0	0	198	17	0	33	77	297	3	0	10	169	130	0	444	0	9130	399	9
TOTAL TO DATE 1988	0	0	234	11	2	51	107	198	4	8	42	362	198	2	286	33	8873	496	3
TOTAL THIS MONTH	0	0	34	1	0	5	16	18	0	3	3	99	28	0	47	4	1233	63	2
ACADIA												1					7		
ALLEN																	2		
ASCENSION																	2	3	
ASSUMPTION												5				1	7		
AVOUELLES																	2	1	
BEAUREGARD																			
BIENVILLE																		1	
BOSSIER								2									4		
CADDO							1	5				4	3		4	2	141	1	1
CALCASIEU			3														50		
CALDWELL			2														1		
CAMERON																	1		
CATAHOULA																	2		
CLAIBORNE																	1		
CONCORDIA																	2		
DESOTO																	1		
EAST BATON ROUGE						1	4					8			4		61	6	
EAST CARROLL																	4		
EAST FELICIANA																	1		
EVANGELINE																	4		
FRANKLIN													3				3	1	
GRANT																	3		
IBERIA						2	1			1		1					21		
IBERVILLE																	2	1	
JACKSON																	6		
JEFFERSON							3	2				8	7				74		
JEFFERSON DAVIS																	4		
LAFAYETTE						1		1		1		4			3		11	1	
LAFOURCHE												4			2		13	2	
LASALLE																			
LINCOLN													1				3	1	
LIVINGSTON				1													1		
MADISON																	7	1	
MOREHOUSE													1		1		4		
NATCHITOCHE																	3	1	
ORLEANS			1				1	3		1	1	26	2		10		547	34	
OUACHITA			2					1				6	3		3		40	2	
PLAQUEMINES			2														5		
POINTE COUPEE																			
RAPIDES			2										2				48	1	1
RED RIVER																	3		
RICHLAND													1		1		3		
SABINE																			
ST. BERNARD											1	2			1		3	1	
ST. CHARLES							5					1					6		
ST. HELENA																			
ST. JAMES																	10		
ST. JOHN												6	1		1		4		
ST. LANDRY			14				1	1				1					12	1	
ST. MARTIN												2			1		3		
ST. MARY												16	1				6		
ST. TAMMANY			8					1				1	2				17		
TANGIPAHOA																	6		
TENSAS																	2		
TERREBONNE											1	2	1		2		27	5	
UNION																	5		
VERMILION						1		2							4		1		
VERNON																	9		
WASHINGTON																	7		
WEBSTER																	18		
WEST BATON ROUGE												1					1		
WEST CARROLL																			
WEST FELICIANA																			
WINN															4		1		
OUT OF STATE																			

From January 1, 1988 - July 31, 1988, the following cases were also reported:

7 - Amebiasis, 1 - Leptospirosis

* Includes Rubella, Congenital Syndrome.

** Includes 17 cases of Hepatitis Non A, Non B.

*** Acquired outside United States unless otherwise stated.

SELECTED REPORTABLE DISEASES

(By Place of Residence)

STATE AND PARISH TOTALS	VACCINE PREVENTABLE DISEASES					ASEPTIC MENINGITIS	HEPATITIS A AND UNSPECIFIED	HEPATITIS B	LEGIONELLOSIS	MALARIA	MENINGOCOCCAL INFECTIONS	SHIGELLOSIS	TUBERCULOSIS, PULMONARY	TYPHOID FEVER	OTHER SALMONELLOSIS	UNDERNUTRITION SEVERE	GONORRHEA	SYPHILIS, PRIMARY AND SECONDARY	RABIES IN ANIMALS (PARISH TOTALS CUMULATIVE 1988)
	MEASLES	RUBELLA	MUMPS	PERTUSSIS	TETANUS														
REPORTED MORBIDITY AUGUST 1988																			
TOTAL TO DATE 1987	0	0	204	30	0	65	95	334	3	0	13	202	164	0	552	0	10388	477	9
TOTAL TO DATE 1988	0	0	252	16	2	66	123	240	5	9	43	439	230	3	361	53	10342	577	7
TOTAL THIS MONTH	0	0	18	5	0	15	16	42	1	1	1	77	32	1	75	20	1469	81	4
ACADIA							1	2										5	
ALLEN													1		1			3	
ASCENSION						2						2						14	1
ASSUMPTION										1		1				2		1	
AVOUELLES																		4	1
BEAUREGARD																		3	
BIENVILLE																		3	1
BOSSIER				1				3					2		1	6		11	1
CADDO						3		3				8			10		122	5	1
CALCASIEU			4										3		8		43	1	
CALDWELL																	3		
CAMERON													2		1				
CATAHOULA																			
CLAIBORNE																		4	
CONCORDIA																			
DESOTO																1		1	1
EAST BATON ROUGE						5		6				22			10		165	21	
EAST CARROLL						1												10	
EAST FELICIANA																		3	
EVANGELINE								1										4	
FRANKLIN								1										4	
GRANT																		1	
IBERIA													1		1			24	1
IBERVILLE								1										8	
JACKSON																		4	
JEFFERSON			2				4	3				6			2		82	2	
JEFFERSON DAVIS															1			8	
LAFAYETTE								3				2			8		35	1	
LAFOURCHE											1	1	1		4		11	1	
LASALLE																			
LINCOLN			4												1		2		
LIVINGSTON																		2	1
MADISON																		9	
MOREHOUSE													1					6	
NATCHITOCHE								1										2	1
ORLEANS			3			2	1	16				14	8		10	4	602	31	
OUACHITA				1								4	1					47	
PLAQUEMINES			1	1				1	1									4	
POINTE COUPEE																		4	
RAPIDES													2		1			35	1
RED RIVER																			
RICHLAND																		9	
SABINE																			
ST. BERNARD												1	1					6	
ST. CHARLES												3		1	1			3	
ST. HELENA																			
ST. JAMES																		2	
ST. JOHN								3				7			2			3	
ST. LANDRY												1						16	
ST. MARTIN													1					7	1
ST. MARY													4			1		8	
ST. TAMMANY			3			1	4	1				2			4		15	4	
TANGIPAHOA								1							1			9	
TENSAS																		3	
TERREBONNE															1	4		29	7
UNION													1					3	
VERMILION												2						2	1
VERNON								1					2		2			39	1
WASHINGTON			1															5	
WEBSTER						1		1					1		1			8	
WEST BATON ROUGE																		3	
WEST CARROLL				2														1	
WEST FELICIANA												1						3	
WINN																		6	
OUT OF STATE																			

From January 1, 1988 - August 31, 1988 the following cases were also reported:

8-Amebiasis, 1-Leptospirosis 1-Rocky Mountain Spotted Fever

* Includes Rubella, Congenital Syndrome.

** Includes 17 cases of Hepatitis Non A, and Non B.

*** Acquired outside United States unless otherwise stated.

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