MAY/JUNE, 1988

LOUISIANA MORBIDITY REPORT

EPIDEMIOLOGY
PUBLIC HEALTH STATISTICS

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A Foodborne Outbreak of Shigella sonnei Gastroenteritis May 1988

On Friday May 27, 1988 the Public Health Nurse from a Parish Health Unit in South Louisiana called the Epidemiology Section, Office of Public Health in New Orleans to report that 26 children at a Primary School, School A, were absent that Thursday 05/26, with reported symptoms of fever and diarrhea of acute onset. This information had been first reported by the School's Principal through the Parish School Board Office.

Further discussions indicated that the total enrollment at School A was 196, from grade K to 4, that 10 to 15 more children had to be sent home during the day for similar symptoms, and that two adult staff members were also ill. Six children had been hospitalized in two local hospitals with a similar clinical picture of acute febrile gastroenteritis, including two with bloody diarrhea. The two suspected common source exposures included the school's tap water and the school cafeteria lunches, which are prepared at School B, 12 miles away, and catered to School A every morning. The tap water was of special concern because it was reported that the Fire Department had been working on the water lines on Wednesday 05/26 around 09:30 a.m., and that water had been subsequently dark then "cloudy" until 12:00 noon, which did not prevent children from drinking it at break times and at the Wednesday 05/25 lunch. Later on Friday 05/27, it was learned that 131 children were absent from School A but that not all of them were ill, and that 10 or 12 children were absent from School B with similar symptoms.

On the basis of this information, an investigation was initiated to further describe the outbreak, to possibly clarify the source and vehicle of the presumed infectious origin, and to offer appropriate recommendations for control, although the schools were to be closed three days later for summer vacations.

On Saturday 05/28, a team from the Epidemiology Section met with the staff of The Parish Health Unit and with the schools' officials to collect detailed information and to make plans for further investigation on Tuesday 05/31, following Memorial Day and last day before schools closed. At that meeting the Chief Fireman explained that routine testing of the pressure on the water line had been performed on Wednesday

05/25 at 9:30 a.m.,which included applying a pressure gauge on one fire hydrant and opening another one. No major drop of pressure was recorded during this procedure and it is not believed that negative pressure could have occurred. It rather seems that the procedure could have caused the line to be flushed, and sediments from the line to be flushed as well and carried to the taps during the following hours. The local Water Plant Manager indicated that the water had been tested on Friday 05/27, with satisfactory total plate counts and coliform counts on the specimens taken above and at the School A taps, and with residual chlorine levels of 1.2 ppm and .8 ppm, respectively.

Containers were given out for stool specimens to be collected from symptomatic school children and staff and their possible symptomatic household contacts, and from all persons at both schools involved in food processing, handling and serving and from their household contacts, regardless of symptoms.

On Saturday 05/28, the physician in charge of 4 children hospitalized in one of the hospitals reported through the Hospital laboratory that 4 of 4 stool cultures were positive for Shigella sonnei, as were several others from children who had visited the hospital as outpatients. The stool culture of the one child hospitalized in the other hospital also yielded S. sonnei..

On Tuesday 05/31, two investigations were conducted:

1. Primary School A.

Most children from Grade 1 through 4 were back to school, attending end-of-year ceremonies. The Kindergarten class was already over. 131 questionnaires on food history and disease status were completed on site, and an additional 15 by phone, i.e. a total of 146 (94%) questionnaires out of a total enrollment of 156 from grade 1 to 4. (Table 1) Disease status, date and time of onset were checked for consistency with the list of absentees and verified by phone when necessary. A case was defined as the occurrence of diarrhea between 05/23 and 05/30, self reported bythe child and/or his/her parents on the questionnaire. A definition of three or more loose stools per day was suggested. Time of onset was rounded to 06:00 am, 12:00 noon, 06:00 pm and 12:00 pm.

Questionnaires were also completed by 15 or 22 staff persons. The two staff persons involved in food service were interviewed on their personnal history, and on food handling and serving procedures.

Twenty three stool specimens were collected: 5 from school children, 7 from staff members, and 11 from household members.

2. Primary School B.

Questionnaires were completed for the 14 case-children present and 14 controls matched for sex and age (within 2 years) Questionnaires were completed for each of seven kitchen workers in a one-to-one interview.

The food preparation, storage, transportation and serving process was reviewed for both schools, with assistance from the kitchen manager and the Parish School Board Food Services Supervisor. 13 stool specimens were collected: one from each kitchen worker (n=7), one from each of two pre-school children of one of the cooks, one from each of two pre-school children of another cook, one from each of two of the case-children.

The summary results include the following:

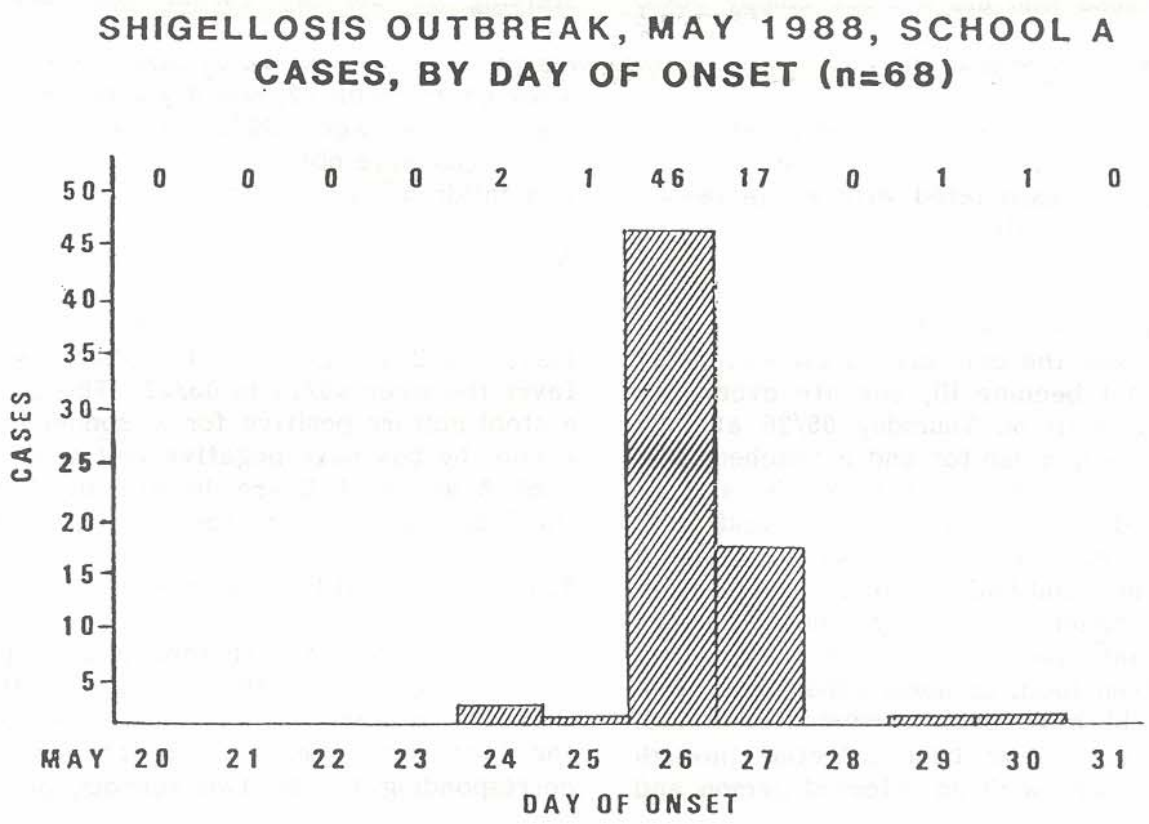
1. Epidemiologic Data:

1.1 Primary School A

Table 1.
Primary School A, Shigellosis Outbreak
Number of Cases and Attack Rates, by Grade.
May, 1988

	Total Enrollment	Completed Questionnaires	Cases	Attack-rate (Percent)
Kindergarten	40	n/a	21	(52)
Grade 1	49	43 (88%)	24	(49)
Grade 2	35	33 (94%)	10	(29)
Grade 3	37	37 (100%)	18	(49)
Grade 4	35	33 (94%)	18	(51)
TOTAL	196	146	91	(46)

Table 2



Seventy cases were identified among the 146 interviewed children from grade 1 through 4, for an attack rate of 45%. When including the 21 cases in Kindergarten children, estimated from the absentees list for 05/25 and 05/26, the total number of cases becomes 91, with an overall estimated attack rate of 46%. 14 were culture confirmed. The breakdown of number of cases by grade is shown on Table 1.

The median time of onset was Thursday 05/26 at 12:00 noon, with 32 of the 70 cases from Grade 1-4 occurring on Thursday 05/26 morning (Table 2). The epidemic curve is suggestive of a common source exposure, with the Wednesday lunch being the most likely exposure factor, for a median incubation time of about 24 hours.

Food specific attack rates analysis indicates that children who ate Sloppy Joes were 1.7 times as likely to become ill as were those who did not (55% versus 32%, Relative Risk = 1.7, 95% Confidence Limits = 9.97, 3.0). Among those who did not eat Sloppy Joes, drinking tap water was not associated with a larger risk of becoming ill.

Other food items, which included tatertots, cucumber salad, peaches and milk, did not appear to be associated with an increased risk of becoming ill.

Of 15 interviewed staff persons, 7 do not eat at the cafeteria and did not become ill. Of 8 who use the cafeteria, 5 ate every day and did not become ill, one ate every day and became ill on Thursday 05/26 at 7:00 pm, and two, a janitor and a teacher, who did not eat on Wednesday 05/25, became ill on Thursday at 4:00 pm, and 8:00 pm, respectively. The teacher was hospitalized for two days and had a stool culture positive for S. sonnei. The way these persons became infected is not clear. They may have gotten food, or some other food item that would have been cross-contaminated, or they may have been infected through direct contact with an infected person and have become ill actually later than reported.

The two staff persons who handle and serve the food at the cafeteria did not become ill and have negative stool cultures.

1.2 Primary School B.

Fifteen cases were notified to the Principal, and 14 were interviewed as well as their parents when available. The 14 cases come from 7 different classes and all grades. The median time of onset is Thursday 12:00 pm. Analysis of food histories does not show evidence of illness being associated with any food item, but numbers are small. Of 6 cases children for whom stool specimens were obtained, three have a stool culture positive for S. sonnei.

Of 7 kitchen workers, 7 eat the cafeteria meals. 5 did not report diarrhea symptoms for themselves or household members during the past three weeks. One, cook A, reports some diarrhea and abdominal cramps starting on Monday 05/23. She has two preschool children at home, one 2 y/o daughter who had unexplained fever the week 05/15 to 05/22, one 4 y/o boy who had diarrhea the week 05/23 to 05/30. Stool specimens were obtained for cook A and the two children, cultures are negative.

Another, cook B, had no diarrhea symptoms but has two preschool children at home: one 5 y/o boy who had diarrhea the first week of May, one 2 y/o girl who had diarrhea and fever the week 05/15 to 05/22. This girl has a stool culture positive for S. sonnei. Cook B and the boy have negative cultures. Both cook A and cook B are directly involved in the food processing and report using gloves.

2. Environmental Investigation

The food served at both schools is prepared as a single line at the School B kitchen. Preparation starts at 6:30 am. When ready, the food items are divided into two sets corresponding to the two schools, put into

appropriate trays or pans, and kept in two separate but identical electric warmers. Food served at School B is kept in the warmer until being served. Food to be served at School A is kept in the warmer until about 10:00 to 10:15, then loaded into a van with three insulated compartments (without warming or cooling equipment) and transported to School A. The transport takes about 20 minutes. The food containers are then transferred to another similar electric warmer until being served. Thus, it appears that the food containers may spend from 40 to 50 minutes out of the warming equipment. At School A, the food is served in two shifts, K and Grade 1 at 11:15 am, Grades 2-3-4 at 12:00. One person, who is also involved in the food preparation at School B, takes care of the transport to School A and serves the children for lunch. Another person assists in serving. Both report using gloves for service. None reports recent diarrhea or children at home with recent diarrhea. Both have negative stool cultures.

Plates used at School A are disposable. Pans, trays and silverware are rinsed after being used at School A then kept overnight in the van to be brought back to School B the next morning where they are washed in the dish washer and then mixed with those used at School B.

At School B, the food preparation and dishwashing areas and equipment appear in very good condition. Appropriate handwashing facilities are available.

Food samples were being kept for no longer than 24 hours. None was available for testing from the meals under investigation.

CONCLUSIONS:

An outbreak of Shigella sonnei gastroenteritis affected two Primary Schools on 05/26 and 05/27 in a South Louisiana Parish. At Primary School A, 91 (46%) of 196 enrollees were affected. At Primary School B, 15 (3.5%) of 433 enrollees were affected. Food served at both schools is prepared as a single line at School B and shipped on a truck to School A, 12 miles away. The most likely common exposure factor seems to be the lunch served on Wednesday 05/25. At School A, epidemiologic evidence suggests that the Sloppy Joes could have been the vehicle of infection. Other food items could also have been contaminated and account for cases in two adults and nine children who did not remember eating this food item. There is no evidence that drinking tap water was associated with becoming ill.

Possible explanations for the difference in attack rates between School A and School B include:

- that some containers of food to be served at School A became contaminated when some containers to be served, at School B were not, or less, contaminated.

- that the time and temperature conditions for storage and transportation of the food served at School A allowed for bacterial growth to take place after it had become contaminated during preparation.

Two kitchen workers involved in the food preparation, including one who had some mild diarrhea symptoms on Monday 05/23, reported having preschool children at home with diarrhea the week before the outbreak. One of these children has a stool culture positive for S. sonnei. Both these persons could have been involved as a source of infection, although this is impossible to demonstrate.

RECOMMENDATIONS:

The recommendations included the following:

- To provide in-service training to the

kitchen workers, with emphasis on hygiene precautions and illness reporting.

- To develop exclusion measures for kitchen workers in case of diarrheal symptoms inself or household members.
- To review, including food temperature testing, the storage and transportation procedures in use for the food which is being shipped to School A.
- To consider alternative strategies or equipment for transport of the food that would not allow breakdown in temperature.
- To keep food samples available for 48 hours.

ACKNOWLEDGEMENTS

This investigation was made possible thanks to the immediate reporting of the situation by the School's officials and by the Parish Health Unit, which allowed for collecting the appropriate information and specimens in a timely fashion. The Epidemiology Section is grateful to the many people involved whose active cooperation was instrumental and greatly appreciated.

Day Care Center Assessment

IMMUNIZATION SECTION

In order to ensure that all children in our state are age appropriately immunized, the Health Department has set up the Vaccine Preventable Disease Section, whose work is in accordance with Louisiana Sanitary Code Chapter II, LSA-40:4 and as mandated by RS 17:170 law.

In order to achieve this goal, the Vaccine Preventable Disease Section, with the help of its Communicable Disease Specialists conduct assessments at three different levels: 1) Day care centers, pre-school, nursery, headstart, etc.; 2) Public and non-public schools first time enterer (k-1st. grade); 3) Health unit pre-school file. In this article we will address immunization assessment of day care centers, pre-schools, nurseries, and headstarts because of their uniqueness and problems. In 1987-88 over 1,350 day care centers in Louisiana were assessed. These assessments help us in several ways:

1. to determine how well the children of Louisiana are vaccinated against vaccine preventable childhood diseases.
2. to identify children that are adequately immunized each year.
3. to identify children that are not optimally immunized.
4. to contact, motivate and bring children back to immunization compliance.
5. to identify susceptible individuals during suspected outbreaks in order to take necessary preventive measures to minimize disease transmission.
6. to maintain an open communication with day care center staff.

METHODOLOGY

All center directors throughout the State receive the "self-assessment" forms in September of each year. These

self-assessments are based on immunization information that the day care centers, nurseries, and pre-schools have in their files. Upon registering a child in a center, the parents/guardians must furnish an immunization record showing complete date (month, day, year) of all immunizations received since birth; moreover, it is the parent/guardian's responsibility to provide the institution with complete immunization up-dates whenever the child receives additional vaccine. Each child's immunization dates are entered on these forms and submitted to the state's Immunization Section for evaluation and tabulation. Once the immunization staff identifies children in need of immunization, the forms are returned to the Centers for follow-up and up-dating. Thereafter, the Centers are required to contact and motivate the parents/guardians of those children identified as needing immunizations. It should be underlined that the goal of the Vaccine Preventable Disease Section is to assure that the children complete their immunization requirements as soon as they are eligible, all in accordance with the Louisiana Immunization Policies and Procedures, American Academy of Pediatrics and the United States Public Health Services Immunization schedule. After up-dating the forms, the Center returns them to the Program Personnel for re-evaluation, tabulation and further follow-up if deemed necessary.

CONSTRAINTS

The three major constraints are as follow:

1. Immunization Records inappropriately completed. In completing the immunization records, all dates (month, day, year) of the immunization the child has received should be stated. No abbreviations.

2. Parents/guardians failure to inform and up-date the child's record at the child care center.

3. Failure of the doctor to provide parent with up-dated record of immunization. Again all dates should be stated, anything else is unacceptable.

Immunization Status of Children by Dose at Centers
That Had an "Initial Only" Assessment
(Louisiana 1987-88)

Number of Child Care Centers		104	
Number of Children in Centers		4,034	
Number of Children Less Than 15 Months of Age,		165	(4.1%)

ANTIGEN	DOSE	NUMBER OF CHILDREN	PERCENT
DTP	0	224	5.6
DTP	1	3,808	94.4
DTP	2	3,608	91.4
DTP	3	3,494	86.7
DTP	4+	2,538	62.9
POLIO	0	249	6.2
POLIO	1	3,783	93.8
POLIO	2	3,645	90.4
POLIO	3	3,041	75.4
POLIO	4+	1,737	43.1
MEASLES	-	3,091	79.9
RUBELLA	-	3,005	77.7
MUMPS	-	2,955	76.4

STATUS OF CHILD CARE CENTERS ASSESSED WITH INITIAL ONLY

Total number of Centers with	initial "only"	104	
Total population assessed with	initial report	4,032	
Total number of children	≤15 months	165	4.1%
Total number of children with	DTP 3+	3,494	86.7
Total number of children with	Polio 3+	3.041	75.4
Total number of children with	Measles	3,091	79.9
Total number of children with	Rubella	3,005	77.7
Total number of children with	Mumps	2,955	76.4

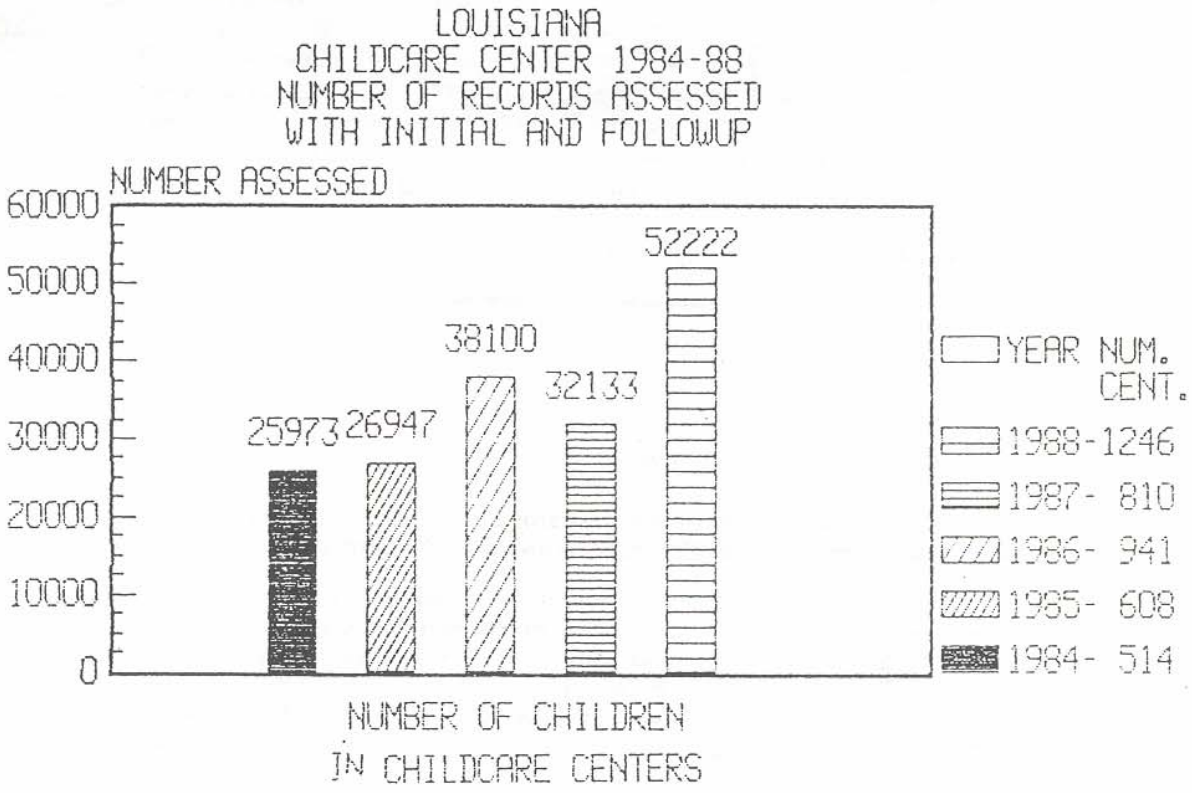
Immunization Status of Children by Dose at Centers That Had an Initial and at Least One Follow-up Assessment (Louisiana 1987-88)

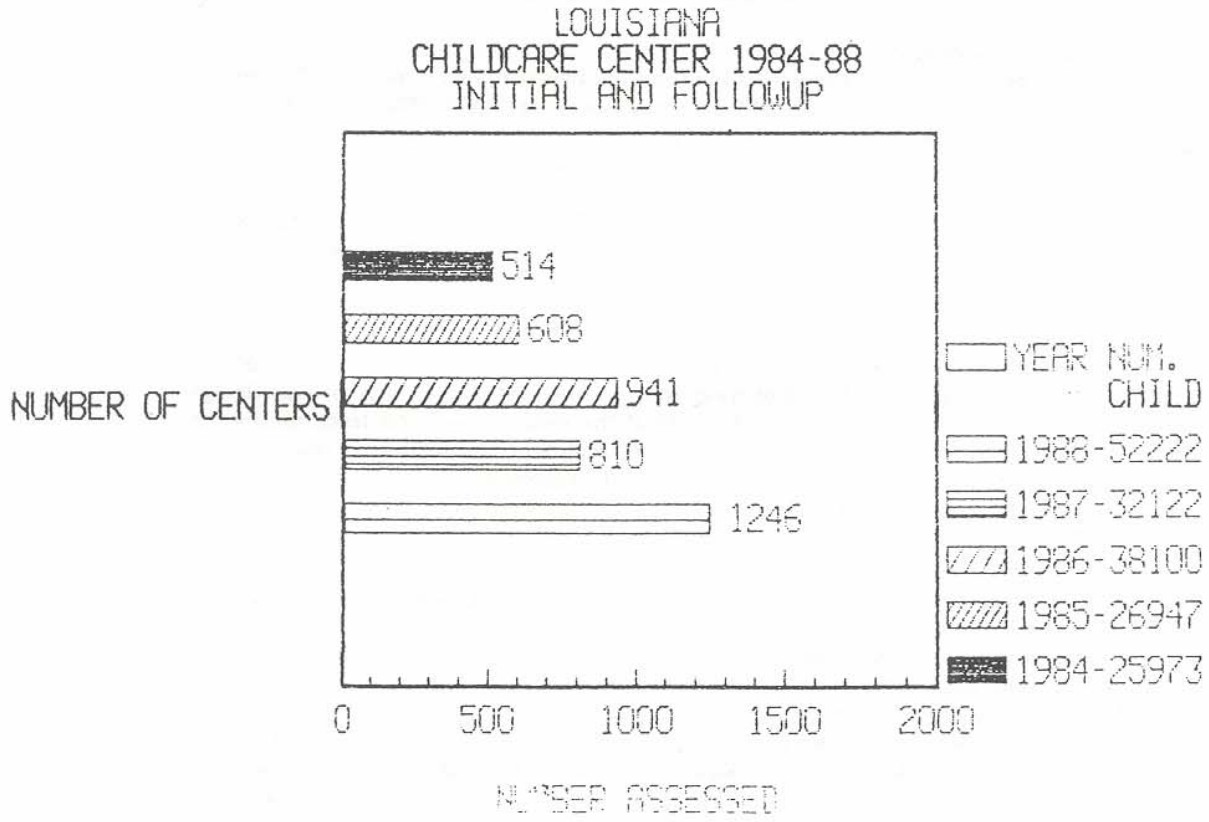
Number of Child Care Centers	1,246	
Number of Children in Centers	52,222	
Number of Children less than 15 months or age	2,682	5.1%

		INITIAL		AFTER FOLLOW-UP	
ANTIGEN	DOSES	NUMBER OF CHILDREN	PERCENT	NUMBER OF CHILDREN	PERCENT
DTP	0	2,011	3.9	722	1.4
DTP	1	50,211	96.1	52,500	98.6
DTP	2	49,434	94.6	50,872	97.4
DTP	3	48,004	91.9	49,459	94.7
DTP	4+	41,260	79.0	43,813	84.0
POLIO	0	2,023	3.9	755	1.4
POLIO	1	50,199	96.1	51,467	98.6
POLIO	2	49,260	94.3	50,778	97.2
POLIO	3	45,459	87.0	47,287	90.5
POLIO	4+	26,610	50.9	28,404	54.4
MEASLES	-	45.097	91.0	47,225	95.3
RUBELLA	-	45,082	91.0	47,231	95.3
MUMPS	-	44,982	90.7	47,175	95.2

STATUS OF CHILD CARE CENTERS ASSESSED WITH INITIAL AND FOLLOW-UP

Total number of "Centers" with	initials/follow-up	1,246	
Total population assessed with	initials/follow-up	52,222	
Total number of children	≤15 months	2,682	5.1%
Total number of children with	DTP 3+	49,726	95.2
Total number of children with	Polio 3+	49,287	90.5
Total number of children with	Measles	47,225	95.3
Total number of children with	Rubella	47,231	95.3
Total number of children with	Mumps	47,175	95.2


LOUISIANA
CHILDCARE CENTER 1984-88
NUMBER OF RECORDS ASSESSED
WITH INITIAL AND FOLLOWUP
NUMBER ASSESSED
60000
50000
40000
30000
20000
10000
0
25973
26947
38100
32133
52222
YEAR NUM. CENT.
1988-1246
1987- 810
1986- 941
1985- 608
1984- 514
NUMBER OF CHILDREN
IN CHILDCARE CENTERS


LOUISIANA
CHILDCARE CENTER 1984-88
INITIAL AND FOLLOWUP
NUMBER OF CENTERS
514
608
941
810
1246
YEAR NUM. CHILD
1988-52222
1987-32122
1986-38100
1985-26947
1984-25973
0
500
1000
1500
2000
NUMBER ASSESSED

CONCLUSION:

Taking time to provide and avoid the aforementioned pitfalls not only helps the parents/guardians know the immunization status of their children but also, avoids unnecessary visits and telephone calls to the doctor's office. It helps the day care centers comply with the Health Department regulations and it means saving time and money in the event of an outbreak situation. But above all, it helps identify those children who are susceptible, thereby helping to protect them from the incidence of vaccine preventable diseases with the associated complications and medical expenses.

Recommendations of the Immunization Practices Advisory Committee

* Prevention of Perinatal Transmission of Hepatitis B Virus: Prenatal Screening of all Pregnant Women for Hepatitis B Surface Antigen

Transmission of hepatitis B virus (HBV) from mother to infant during the perinatal period represents one of the most efficient modes of HBV infection and often leads to severe long-term sequelae. Infants born to mothers positive for hepatitis B surface antigen (HBsAg) and hepatitis B "e" antigen (HBeAg) have a 70%–90% chance of acquiring perinatal HBV infection, and 85%–90% of infected infants will become chronic HBV carriers (*1,2*). It has been estimated that more than 25% of these carriers will die from primary hepatocellular carcinoma or cirrhosis of the liver (*3*). These deaths usually occur during adulthood, when familial and financial responsibilities make them particularly devastating. In the United States, an estimated 16,500 births occur to HBsAg-positive women each year (about 4,300 of whom are also HBeAg-positive), and approximately 3,500 of these infants become chronic HBV carriers. **Prenatal screening of all pregnant women would identify those who are HBsAg-positive and thus would allow treatment of their newborns with hepatitis B immune globulin (HBIG) and hepatitis B (HB) vaccine, a regimen that is 85%–95% effective in preventing the development of the HBV chronic carrier state (*2,4–6*).**

In 1984, the Immunization Practices Advisory Committee (ACIP) recommended that pregnant women in certain groups at high risk for HBV infection be screened for HBsAg during a prenatal visit and, if found to be HBsAg-positive, that their newborns receive HBIG and HB vaccine at birth (*7*). No data are available regarding the proportion of high-risk women currently being screened in clinical practice, but several studies and the experience of public health workers indicate that major problems have been encountered in implementing these recommendations (*8–12*). These include 1) concerns about the sensitivity, specificity, and practicality of the **current ACIP guidelines for identifying HBV carrier mothers; 2) lack of knowledge among prenatal health-care providers about the risks of perinatal transmission of** HBV and about recommended screening and treatment procedures; 3) poor coordination among medical-care workers who provide treatment and follow-up of mothers and infants; and 4) refusal of some public and private third-party payers to reimburse for HBV screening of pregnant women and treatment of their infants. In addition, concern has been expressed that these recommendations may not be practical or applicable in some U.S. jurisdictions where HBV infection is highly endemic, such as parts of Alaska and certain Pacific Islands.

The problems encountered in implementing the currently recommended strategy of screening high-risk women have been examined by a number of investigators. Recent studies in several large inner-city hospitals, where all pregnant women were tested for HBsAg, have found that only about 35%–65% of HBsAg-positive mothers would have been identified by following the current ACIP guidelines (*8–12*). In these studies, the prevalence of HBsAg in inner-city black (0.4%–1.5%) and Hispanic women

* Reprint from MMWR, Centers for Disease Control, June 10, 1988, Vol. 37, No. 22, pp 341-351

was higher than expected. Several investigators expressed concern that many health-care providers are too busy or may be reluctant to obtain the sexual and drug-use history necessary to identify high-risk patients for screening. In addition, persons providing health care to pregnant women often are not aware of the risks of perinatal transmission of HBV and of the recommended screening and treatment guidelines. In one study, 40% of obstetricians could name no more than two groups at high risk for HBV infection, and only 28% knew the recommended treatment for infants born to HBV carrier mothers (CDC, unpublished data).

Given these limitations, it is now evident that routine screening of all pregnant women is the only strategy that will provide acceptable control of perinatal transmission of HBV infection in the United States. Screening the approximately 3.5 million pregnant women per year for HBsAg would identify 16,500 positive women and allow treatment that would prevent about 3,500 infants from becoming HBV carriers. Recent studies also indicate that the costs and benefits of universal testing of mothers are comparable to those encountered in other widely implemented programs of prenatal and blood-donor screening (*13,14*). The cost of an HBsAg test ranges from an estimated $3.50 per test in blood-bank laboratories to $21.00 per test in private commercial laboratories. If one assumes an average screening cost ranging from $12.00 to $20.00 per test plus $150.00 for the HBIG and vaccine needed to treat each infant of an HBsAg-positive mother, the cost to prevent one newborn infant from becoming a chronic HBV carrier would be between $12,700 and $20,700.

HBsAg testing should be done early in pregnancy when other routine prenatal testing is done. The HBsAg test is widely available and can be added to the routine prenatal "panel" of tests without requiring additional patient visits. The advantages of making HBsAg testing routine during early pregnancy include 1) the ability to identify HBV carrier mothers that is not dependent on the health-care provider's identifying high-risk women or ordering HBsAg as a special test; 2) the availability of test results before delivery so that infants can receive HBIG and vaccine without delay after birth; and 3) appropriate counseling of families before delivery (*15*).

Because more than 90% of women found to be HBsAg-positive on routine screening will be HBV carriers, routine follow-up testing later in pregnancy is not necessary for the purpose of screening. In special situations, such as when the mother is thought to have acute hepatitis, when there has been a history of exposure to hepatitis, or when particularly high-risk behavior such as parenteral drug abuse has occurred during the pregnancy, an additional HBsAg test can be ordered during the third trimester. Few women in populations at low risk for HBV infection will have a change in HBsAg status during subsequent pregnancies. However, because of the expected benefits of making HBsAg testing a routine part of each prenatal panel, testing should be done during each pregnancy.

Women who present for delivery without prenatal care or without medical records documenting the results of HBsAg screening should have the HBsAg test done as soon as possible after admission, since delay in administration of HBIG to infants of carrier mothers will decrease the efficacy of therapy. In the studies that demonstrated the highest efficacy (85%–95%) of combined HBIG and HB vaccine prophylaxis, HBIG was administered within 2–12 hours after birth (*2,4–6*). In one study in which only HBIG was used for prophylaxis, no efficacy was found if HBIG was given more than 7 days after birth, and a significant decrease in efficacy was observed if it was given more than 48 hours after birth (*16*). Only one-third of U.S. hospitals currently perform the HBsAg test as an in-house procedure, and many of these have technicians who are trained to do the test available on only one shift. Hospitals that cannot rapidly test for HBsAg should either develop this capability or arrange for testing to be done at a local laboratory or blood bank where test results can be obtained within 24 hours.

The commercially available HBsAg tests have an extremely high sensitivity and specificity if positive tests are repeated and confirmed by neutralization as recommended by the manufacturers of the reagent kits. Testing for other markers of HBV infection, such as HBeAg, is not necessary for maternal screening. Mothers who are positive for both HBsAg and HBeAg have the highest likelihood of transmitting HBV to their newborns. However, infants of mothers who are HBsAg-positive but HBeAg-negative may become infected and develop severe, even fatal, fulminant hepatitis B during infancy (*17,18*). For this reason, HBIG and HB vaccine treatment of all babies born to HBsAg-positive women is recommended.

HBsAg-positive mothers identified during screening may have HBV-related acute or chronic liver disease and should be evaluated by a physician. Identification of women who are HBV carriers through prenatal screening presents an opportunity to vaccinate susceptible household members and sexual partners of HBV carriers, as previously recommended (*19*). Screening and vaccination of susceptible contacts should be done by the family's pediatrician, primary health-care provider, or the physician evaluating the clinical status of the HBsAg-positive pregnant women.

Implementation of the recommendations to prevent perinatal transmission requires maternal screening, treatment of the newborn in the hospital, and administration of subsequent doses of HB vaccine to the infant during pediatric visits at 1 and 6 months of age. This multistep process requires effective transfer of information among several groups of health-care providers, knowledge of recommended treatment, and availability of HBIG and vaccine at separate facilities. Treatment failures due to lack of communication among health-care providers can occur, especially in situations where prenatal, obstetric, and pediatric care are provided in different facilities (*20*). Central coordination of the treatment of these infants by city, county, or state health departments would improve the education of the health-care providers involved and increase the likelihood that proper treatment is provided.

In certain populations under U.S. jurisdiction, including Alaskan Natives and Pacific Islanders, as well as in many other parts of the world, HBV infection is highly endemic in the general population, and transmission occurs primarily during childhood (*21*). In such groups, universal vaccination of newborns with HB vaccine is recommended to prevent disease transmission both during the perinatal period and during childhood. Several studies have shown that HB vaccine given without HBIG will prevent 70%–85% of perinatal HBV infections and 95% of early childhood infections (*22,23*). In many of these areas with highly endemic HBV infection, prenatal screening is impractical because the population is isolated, laboratory facilities are not available, and/or health-care budgets and personnel are limited. In these areas, control of HBV infection can be better achieved by directing available resources into programs to vaccinate all children with HB vaccine. Programs for screening all mothers for HBsAg and providing HBIG to infants born to carrier mothers are costly and will add only modestly to disease prevention. They should be considered only after the program for universal vaccination of children has been implemented.

RECOMMENDATIONS

All pregnant women should be routinely tested for HBsAg during an early prenatal visit in each pregnancy. This testing should be done at the same time that other routine prenatal screening tests are ordered. In special situations, such as when acute hepatitis is suspected, when there has been a history of exposure to hepatitis, or when the mother has a particularly high-risk behavior such as intravenous drug abuse, an additional HBsAg test can be ordered later in the pregnancy.

If a woman has not been screened prenatally or if test results are not available at the time of admission for delivery, HBsAg testing should be done at the time of admission, or as soon as possible thereafter. If the mother is identified as HBsAg-

positive more than 1 month after giving birth, the infant should first be tested for HBsAg; if negative, the infant should be treated with HBIG and HB vaccine. Hospitals where infants are delivered should have HBsAg testing capabilities or should be able to obtain HBsAg results within 24 hours from a local laboratory.

If a serum specimen is positive for HBsAg, the same specimen should be tested again, and then the test results should be confirmed by neutralization. It is unnecessary to test for other HBV markers during maternal screening, although HBsAg-positive mothers identified during screening may have HBV-related acute or chronic liver disease and should be evaluated by their physician.

Infants born to HBsAg-positive mothers should receive HBIG (0.5 mL) intramuscularly (IM) once they are physiologically stable, preferably within 12 hours after birth. HB vaccine, either plasma-derived (10 μg per dose) or recombinant (5 μg per dose), should be administered IM in three doses of 0.5 mL each. The first dose should be given concurrently with HBIG but at a different site. If vaccine is not immediately available, the first dose can be given within 7 days after birth. The second and third doses should be given 1 month and 6 months after the first. Testing the infant for HBsAg and its antibody (anti-HBs) is recommended at 12–15 months of age to monitor the effectiveness of therapy. If HBsAg is not detectable and anti-HBs is present, the child can be considered protected. Testing for antibody to hepatitis B core antigen (anti-HBc) is not useful, since maternal anti-HBc can persist for more than a year. HBIG and HB vaccination do not interfere with the routine childhood immunizations.

Household members and sexual partners of HBV carriers identified through prenatal screening should be tested to determine susceptibility to HBV infection and, if susceptible, should receive HB vaccine. Screening and vaccination of susceptible contacts should be done by the family's pediatrician, primary health-care provider, or the physician evaluating the clinical status of the HBsAg-positive pregnant women.

Obstetric and pediatric staff should be notified directly about HBsAg-positive mothers so that the neonate can receive therapy without delay after birth and follow-up doses of vaccine can be given. Hospitals, as well as state, county, and city health departments, should establish programs to educate appropriate health-care providers about perinatal transmission of HBV and its control through maternal screening, treatment of infants, and vaccination of susceptible household and sexual contacts of HBV carrier women.

Programs to coordinate the activities of those providing prenatal care, hospital-based obstetrical services, and pediatric well-baby care must be established to assure proper follow-up and treatment of infants born to HBsAg-positive mothers and other susceptible household and sexual contacts.

In populations under U.S. jurisdiction in which hepatitis B infection is highly endemic, including certain Alaskan Native and Pacific Island groups, vaccination of all newborns with HB vaccine is the most effective strategy for HB control. In these populations, such vaccination programs should be given highest priority. In areas where HBsAg screening of mothers and use of HBIG in infants born to HBV carrier mothers are not practical, the vaccination of all newborns with HB vaccine should be considered the appropriate treatment.

Editorial Note: Hepatitis B vaccine is the first human vaccine that can prevent both serious chronic disease and a uniformly fatal type of cancer. These recommendations, developed in consultation with representatives of the American College of Obstetricians and Gynecologists and the American Academy of Pediatrics, represent a major step toward control of perinatal hepatitis B transmission in the United States. Programs for universal screening of pregnant women are currently in progress in Hawaii, certain Canadian provinces, Italy, West Germany, New Zealand, Australia,

and Japan. More extensive infant HB vaccination programs are in progress in Alaska, American Samoa, Korea, Taiwan, Singapore, and the People's Republic of China. A number of U.S. health-care facilities have already begun to screen all pregnant women for HBsAg.

State and local health departments can facilitate implementation of these recommendations by 1) working to assure that all women receiving prenatal care in both public and private sector programs are offered screening and appropriate treatment; 2) working to assure that costs of screening and treatment are covered by public and private third-party payers; 3) establishing programs to coordinate the transfer of information between prenatal, obstetric, and pediatric health-care providers; and 4) providing health education about hepatitis B to the public and to health-care providers. CDC will continue to work with state and local health agencies and professional associations in hepatitis B prevention and control.

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LOUISIANA AIDS UPDATE

	CASES	DEATHS	PERCENT
1988 (thru 6/30/88)	105	36	34
TOTAL, ALL YEARS	896	574	64

Vibrio Infections Become Reportable

The Sanitary Code of the State of Louisiana has been amended July, 1988, to include all Vibrio infections in the list of diseases that must be reported to the local Health Unit or to the Epidemiology Section, Office of Public Health, Department of Health and Hospitals. Vibrio Cholera, type 01 infections have been reportable since the beginning of the Health Department and continue to be of utmost importance in our state. However, we must learn as much as possible about the epidemiology of the other Vibrio species.

Any clinical illness related to laboratory confirmed Vibrio species should be reported as early as possible. This may include:

- gastrointestinal illness
- septicemia
- cellulitis
- wound infection
- other rare conditions

Reporting is to be done with the usual form **EPI 2430 ("green card") which can be obtained from the local Health Units.**

In addition , all laboratories are being asked to send all Vibrio isolates to the nearest State Laboratory for confirmation.

Since the 1978 cholera outbreak in Louisiana, there has been a renewed interest in Vibrio infections in Louisiana and all along the Gulf Coast. This is due in part to **a better availability of identification techniques and increased number of cases** along the Gulf Coast related to shellfish consumption.

The most severe, often fatal, of these infections are associated with V. vulnificus. Sixty cases of V. vulnificus have been reported in Louisiana since 1980. The two most common clinical pictures are primary septicemia following consumption of raw oysters, and severe cellulitis following exposure of a wound to seawater or drippings from raw seafoods. Most cases have occurred between April and November. Of 28 cases of primary septicemia, 18 (64 %) died. A large majority of these patients were aged 55 years or older and had underlying conditions such as liver disease, malignancies or diabetes. Because all these patients were hospitalized for severe forms of Vibrio vulnificus infection, it is likely that many less severe cases go unrecognized and unreported. For these reasons, persons with severe underlying illness, liver or stomach diseases, malignancies and other immuno-compromising conditions should be warned against eating raw oysters or undercooked seafood.

In March, 1988, representatives of State Health Departments, Universities, seafood industry, the United States Food and Drug Administration and the Centers for Disease Control met in Washington, D.C. to discuss the problem of V. vulnificus infections **caused by shellfish and some potential control methods. It was concluded that** additional information was needed concerning these infections and their sources. Accordingly, State Health Departments, the CDC and U.S. FDA are beginning collaborative investigations in the states of Texas, Louisiana, Alabama and Florida. This will include the collection of standard information on each reported case, and intensive investigation by state shellfish **authorities and FDA of the harvesting, shipping and handling history of any** associated shellfish.

Making all Vibrio infections reportable is part of this effort towards improving our surveillance and providing the community with appropriate recommendations for prevention and control.

For further information, please call the Epidemiology Section at 504-568-5005.

Selected Reportable Diseases

(By Place of Residence)

State and Parish Totals REPORTED MORBIDITY MAY 1988	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	180	10	0	20	48	219	2	0	10	111	95	0	323	0	6627	285	5
TOTAL TO DATE 1988	0	0	159	7	1	28	79	146	3	3	33	195	148	2	185	24	6085	337	0
TOTAL THIS MONTH	0	0	30	5	0	12	15	37	0	1	4	38	47	0	35	24	1291	4	0
ACADIA													1				4		
ALLEN													1				3		
ASCENSION								1									3		
ASSUMPTION												1					1		
AVOYELLES													2				7		
BEAUREGARD				1													4		
BIENVILLE																	2		
BOSSIER				1		1		1							3	2	5		
CADDO							4	7			1	4	6		7	4	106	7	
CALCASIEU			12								1		1		1		37	1	
CALDWELL															1				
CAMERON													1				3		
CATAHOULA							1										2		
CLAIBORNE								1									3		
CONCORDIA								1									3		
DESOTO								1					1				2		
EAST BATON ROUGE						1	1	3				5	3		1		114	11	
EAST CARROLL			2														4		
EAST FELICIANA						1											1		
EVANGELINE			2															1	
FRANKLIN																	11		
GRANT													1				2		
IBERIA								1									11	2	
IBERVILLE							1						1				10		
JACKSON																	2		
JEFFERSON			6			2	1	2			2	3	5		2	3	58	2	
JEFFERSON DAVIS																	3		
LAFAYETTE												4			2		36		
LAFOURCHE				2		1							2			1	8	1	
LASALLE																			
LINCOLN																	3		
LIVINGSTON																	3		
MADISON			4														9		
MOREHOUSE			1										2				10		
NATCHITOCHES			1				1										4	3	
ORLEANS						4	5	8		1		5	8		4	4	566	31	
OUACHITA												1	7		1	1	31		
PLAQUEMINES								1									1		
POINTE COUPEE																	4		
RAPIDES								2							1		52		
RED RIVER																			
RICHLAND																	10		
SABINE													1						
ST. BERNARD							1	2					1		2	3	6		
ST. CHARLES						1		1					1				2		
ST. HELENA												2					2		
ST. JAMES																			
ST. JOHN												3			1		1		
ST. LANDRY															1		6	4	
ST. MARTIN								1				1					11	1	
ST. MARY												3			1		6		
ST. TAMMANY			2					2				1			2	2	6	5	
TANGIPAHOA								1					1		1		21	2	
TENSAS																			
TERREBONNE						1						5	1		2		28	2	
UNION																	2		
VERMILION															2		2		
VERNON																	17		
WASHINGTON								1								1	4		
WEBSTER																1	20	1	
WEST BATON ROUGE																			
WEST CARROLL																	3		
WEST FELICIANA																	12		
WINN																	4		
OUT OF STATE																2			

From January 1, 1988 - May 31, 1988 the following cases were also reported:
6-Amebiasis,

* Includes Rubella, Congenital Syndrome.

** Includes 12 cases of Hepatitis Non A, and Non B.

*** Acquired outside United States unless otherwise stated.

Selected Reportable Diseases

(By Place of Residence)

State and Parish Totals REPORTED MORBIDITY JUNE 1988	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	192	12	0	28	67	253	2	0	10	134	124	0	361	0	7647	334	9
TOTAL TO DATE 1988	0	0	200	10	2	46	180	198	4	5	39	263	170	2	239	29	7664	433	1
TOTAL THIS MONTH	0	0	41	3	1	18	12	34	1	2	6	68	22	0	54	5	1594	96	1
ACADIA																	8		
ALLEN																	1		
ASCENSION							1					1					1	1	
ASSUMPTION												1			1		2		
AVOYELLES				1		1											1		1
BEAUREGARD								2									3		
BIENVILLE																			
BOSSIER								2				1					6		
CADDO						2	1	3			1	1			6	1	201	4	
CALCASIEU			23				1	2			1		2		3		45	1	
CALDWELL			1																
CAMERON													1						
CATAHOULA											1						2		
CLAIBORNE																	7		
CONCORDIA				1													2		
DESOTO																	3		
EAST BATON ROUGE						4	1	3				5	1		4		84	16	
EAST CARROLL																	5		
EAST FELICIANA																		1	
EVANGELINE															1		3		
FRANKLIN										1			1				4		
GRANT																	2		
IBERIA								1				1			2		17	3	
IBERVILLE													1				1		
JACKSON																	5		
JEFFERSON			1			3	3	6	1		3	12			6		105	12	
JEFFERSON DAVIS			1																
LAFAYETTE						1		3				8			8		37	1	
LAFOURCHE												4			1		20	1	
LASALLE																		1	
LINCOLN																	10	1	
LIVINGSTON																	3	2	
MADISON			5														10	1	
MOREHOUSE													1		1		3		
NATCHITOCHES			2												1		10		
ORLEANS			5	1	1	4	2	6				20	7		11	1	669	36	
OUACHITA								1				2	3			1	77		
PLAQUEMINES																	3		
POINTE COUPEE															1		1		
RAPIDES															1		40		
RED RIVER																			
RICHLAND																	4		
SABINE			1																
ST. BERNARD			1				1	1									8		
ST. CHARLES																1	9		
ST. HELENA																	1		
ST. JAMES												1					5	1	
ST. JOHN												1					6	1	
ST. LANDRY			1					1							2		9	5	
ST. MARTIN							1	1									8	1	
ST. MARY												5					9		
ST. TAMMANY													1		1		19	4	
TANGIPAHOA																	14		
TENSAS																	2		
TERREBONNE						2						4	1		1	1	30	2	
UNION													1				11		
VERMILION												1					4		
VERNON							1	2		1							28	1	
WASHINGTON													1		2		4		
WEBSTER															1		21		
WEST BATON ROUGE																	2		
WEST CARROLL																	1		
WEST FELICIANA						1											3		
WINN																	5		
OUT OF STATE																			

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

* Includes Rubella, Congenital Syndrome.

** Includes 15 cases of Hepatitis Non A, Non B.

*** Acquired outside United States unless otherwise stated.

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