

LOUISIANA MONTHLY MORBIDITY LHSASA

DISEASES REPORTED DURING THE MONTH OF

SEPTEMBER, 1973

BY PARISH OF RESIDENCE

OCTOBER - "IMMUNIZATION ACTION MONTH"

Jack Snowden
Vaccination Assistance Program

Immunization is old hat for many of us as public and private health care providers. Why proclaim a special month for immunization similar to "National Pickle Week"? Do we need a sales boost for shots?

The fact is, slowly but surely, protection levels for polio, measles and other immunizable diseases have been dropping. The latest national data indicates that preschool levels for polio stand at 62% protected with three doses. (Louisiana's levels are probably not much better, since our surveys indicate that only 57% of our two-year old children have received three doses of polio vaccine.)

Representatives from the Center for Disease Control, professional medical associations and several drug manufacturers met this summer to determine what could be done to reverse this dangerous trend. They decided to "kickoff" a nation-wide drive starting in October proclaiming

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BUREAU OF VITAL STATISTICS

DIVISION OF HEALTH MAINTENANCE AND AMBULATORY PATIENT SERVICES

Prepared by: DIVISION OF TABULATION & ANALYSIS	ASEPTIC MENINGITIS	DIPHTHERIA	ENCEPHALITIS	ENCEPHALITIS, POST INFECTION	INFECTIOUS AND SERUM HEPATITIS	TUBERCULOSIS, PULMONARY	MENINGOCOCCAL INFECTIONS	PERTUSSIS	POLIOMYELITIS, PARALYTIC	RABIES IN ANIMALS	RHEUMATIC FEVER	RUBELLA *	SHIGELLOSIS	TYPHOID FEVER	OTHER SALMONELLOSIS	TETANUS	MEASLES	GONORRHEA	SYPHILIS, PRIMARY AND SECONDARY
TOTAL TO DATE 19 72	71	4	12	9	559	412	38	37	0	37	11	91	123	6	125	5	86	13032	677
TOTAL TO DATE 19 73	93	0	13	4	655	407	39	12	0	38	20	99	200	6	172	3	84	17425	641
TOTAL THIS MONTH	13	0	0	0	86	22	3	0	0	2	6	0	22	0	33	0	0	1876	80
ACADIA					3													7	
ALLEN																		2	
ASCENSION																		4	
ASSUMPTION																		11	
AVOUELLES																		8	
BEAUREGARD																		4	
BIENVILLE																		4	
BOSSIER					3													14	5
CADDO					5													169	3
CALCASIEU						1							3					68	
CALDWELL						1												1	
CAMERON																		2	
CATAHOULA																			1
CLAIBORNE																		4	
CONCORDIA																		11	
DESOTO																			
EAST BATON ROUGE					6	1							1		7			132	7
EAST CARROLL																		9	
EAST FELICIANA																		6	
EVANGELINE	1				1														
FRANKLIN																		1	
GRANT																		1	
IBERIA					1													4	8
IBERVILLE					3	1												2	1

*Includes Rubella, Congenital Syndrome.

the month "Immunization Action Month."

Their recommendations for the month are not merely to increase efforts to reach the "hard-core" unimmunized. We all know that a certain percentage of parents cannot be motivated regardless of efforts, short of gunpoint. The main concern is that a number of preschool children do start their immunizations, but for a number of reasons, drop out before receiving the complete series. This group, estimated to be over 20% of our preschoolers, has been reached, but somehow we fail to maintain contact. Many will be reached again when they start school, but a three or four year gap in protection shouldn't be a risk we're prepared to take.

The list of activities below includes recommendations arrived at by the national representatives of public and private medicine. These activities are squarely aimed at "immunization dropouts."

1. Mass media publicity and locally based health education for parents

urging them to check their children's "shot records" and see that they are protected.

2. Professional medical associations will ask private physicians to review the records of children under their care and contact parents for needed boosters, etc.
3. Public health workers are asked to evaluate their methods of following up children who miss scheduled immunizations. Immunity levels of children entering school will be assessed by survey of immunization records in selected elementary schools throughout the state.

If National Pickle Week sells pickles, why not? Every month should be immunization month. Designating one month - October - as IMMUNIZATION ACTION MONTH focuses attention on the need.

THE CHOLERA THREAT

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EIS Officer
Section of Epidemiology

Recent reports of cholera from Italy and other European countries have echoed in America like distant drums, heralding the advance of some unfamiliar foe upon our bastion of presumed fine sanitation and technologically perfect medicine. News of a mortality rate of 5% among Italian cases, when it arrived, should have been disquieting in light of an expected mortality rate of less than 1%, but seemed to do little more than revive our cultural suspicion of non-American medicine. Then came news of a bona fide case of cholera in Port Lavaca, Texas. Did this case represent the vanguard of that same trans-Atlantic foe, or just one of those rare flukes of nature which happened to coincide with similar flukes in Europe?

No one has the foresight to answer this question with complete authority, and yet, for reasons to be elaborated later, cholera does not seem to pose any great threat to America at this time, nor is it ever again likely to reach epidemic proportions in this country. However, like many of those other exotic diseases heard about in some long since forgotten medical school lecture or Reader's Digest article, it is alive and flourishing in many areas of the world, and through the

miracle of jet age transportation, has the potential to find its way to the waiting room of any American physician. Because cholera and many of these other "exotic" diseases require definitive treatment with a minimum of delay in order to avoid loss of the patient, it behooves the practitioner of every area of American medicine to have a working knowledge of diseases which are not necessarily indigenous to his own area. Only in this way can he hope to avoid situations similar to the one that led to Italy's excessive mortality rate during their current cholera outbreak.

Background

The writings of early historians indicate that cholera has been endemic in the Ganges-Brahmaputra delta of Bengal (Bangladesh and N.E. India) since remote times. During the 19th century repeated pandemics of the disease spread from this region to many areas of the world. The United States was involved in a number of these - the last in 1873.

The current pandemic, the seventh, began in 1961 on the islands of Sulawesi (Celebes) in

SEPTEMBER, 1973

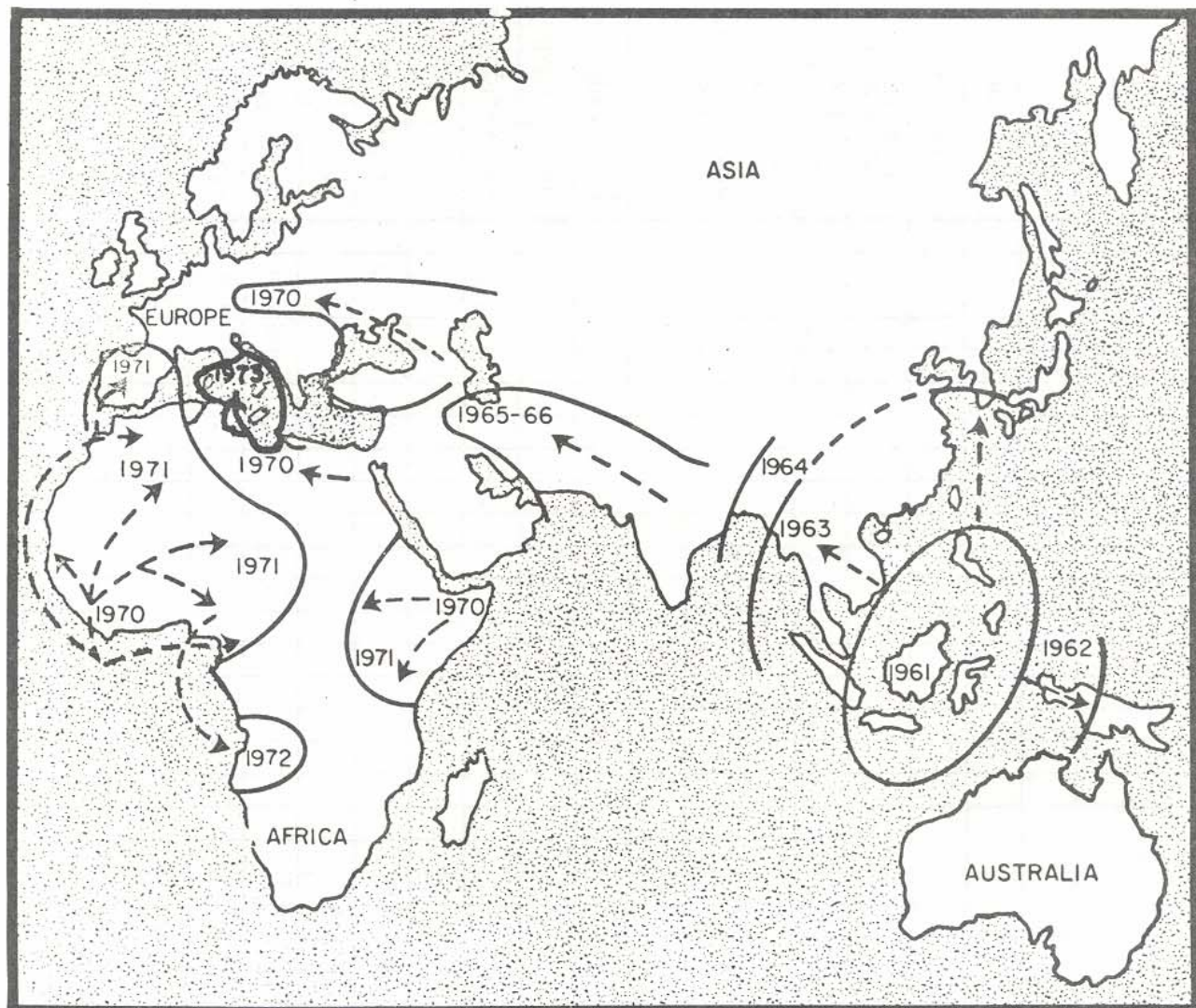


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JACKSON																			1	
JEFFERSON	1					9	1					1		9		9			134	9
JEFFERSON DAVIS						1													5	
LAFAYETTE	1					2										2			21	
LAFOURCHE						3		1								1			13	
LASALLE																			3	
LINCOLN																			28	
LIVINGSTON																			14	3
MADISON												1							6	
MOREHOUSE						1													14	
NATCHITOCHES						3										1			28	1
ORLEANS	10					27	7	1				2		9		12			678	20
OUACHITA						1	2				1	1							77	7
PLAQUEMINES							2												2	
POINTE COUPEE																			2	1
RAPIDES						2													63	1
RED RIVER																				1
RICHLAND																			3	
SABINE																			4	
ST. BERNARD						3													6	1
ST. CHARLES												1				1			10	
ST. HELENA																			1	
ST. JAMES																			4	
ST. JOHN						1													3	1
ST. LANDRY						2													43	
ST. MARTIN																			13	1
ST. MARY						1	1												9	6
ST. TAMMANY						3	2												23	
TANGIPAHOA						2													22	1
TENSAS																			4	
TERREBONNE						1		1											20	
UNION																			8	
VERMILION						1														
VERNON																			67	1
WASHINGTON						1	3												30	
WEBSTER											1								10	
WEST BATON ROUGE																			4	1
WEST CARROLL																			10	
WEST FELICIANA																			22	
WINN																			6	
OUT OF STATE																			1	

From January 1 through September 30, the following cases were also reported: 3-Actinomycosis; 6-Brucellosis; 2-Malaria.

Figure 1
EXTENSION OF EL TOR CHOLERA, 1961-1973



SOURCE: PRINCIPLES AND PRACTICE OF CHOLERA CONTROL, PUBLIC HEALTH PAPERS, NO. 40, WHO, GENEVA, 1970 REVISED ACCORDING TO WEEKLY EPIDEMIOLOGICAL RECORD

Indonesia. From this initial focus the disease spread throughout most of Asia during the years 1961-1965, then to the Middle East in 1965-1969 and to Africa in 1970 (See Figure #1). Early in 1973, isolated cases were imported to several European countries, primarily by travelers returning from vacations in northern Africa.

At the present time 18 countries are recognized by the World Health Organization as being cholera infected. These are listed in Table #1.

The Organism

Koch first identified *Vibrio cholerae* as the causative agent of this disease in 1883 in the

Table #1
**Countries with Areas Infected with Cholera
According to the World Health Organization
as of the Week Ending 3 October 1973**

Algeria	Malaysia
Angola	Mozambique
Bangladesh	Niger
Cameroon	Nigeria
Ghana	Philippines
India	Senegal
Indonesia	Thailand
Italy	Tunisia
Khmer Rep.	Upper Volta
Liberia	Vietnam Rep.

feces of a large number of patients with cholera. The organism is a comma-shaped, non-spore forming gram negative rod which possesses a single polar flagellum. Like other vibrios it has a characteristic motility which is easily seen under the darkfield microscope. Darkfield examination for this motility enables a trained investigator to make a rapid diagnosis of cholera in a matter of minutes with 80% accuracy using only a wet preparation of the patient's stool and an appropriate microscope.

Most vibrios will grow on synthetic media containing asparagin and a suitable mixture of mineral salts. They grow well on ordinary laboratory media except for some dye-containing laboratory ones used in enteric work. Sodium taurocholate and potassium telurite have been combined with Monsur's medium to produce a medium specific for the vibrio. T.C.B.S. (Thiosulfate-Citrate-Bile Salt-Sucrose) agar is also useful for this purpose.

The cholera vibrios can be differentiated from other vibrios by virtue of the fact that they all liquify gelatin, produce indol, and reduce nitrate. Two distinct biotypes of the cholera vibrio, Classical and El Tor, have been identified on the basis of their response to certain laboratory tests. These are listed in Table #2.

Both biotypes can be differentiated further into Inaba, Ogawa, or Hikojima serotypes on the basis of their having one, two, or three specific antigens as demonstrated by agglutination with specific antisera.

The cholera vibrio is a fragile organism which does not survive well outside of man, its

Table #2
A Comparison of the Classical and El Tor Biotypes of *V. Cholerae* with Respect to Characteristic Reactions

Test	Classical	El Tor
Sheep cell hemolysis	-	+
Chicken cell agglutination	-	+
Polymin B sensitivity	+	-
Phage IV sensitivity	-	+
Sensitivity to 0.05 mg. conc. of sulfathiazole	-	+

only known natural reservoir. It is easily destroyed by chlorination and exposure to sunlight. However, because of its affinity for salt water which eliminates many other competing organisms, the cholera vibrio may survive for long periods of time in sea waters along beaches contaminated with human sewage.

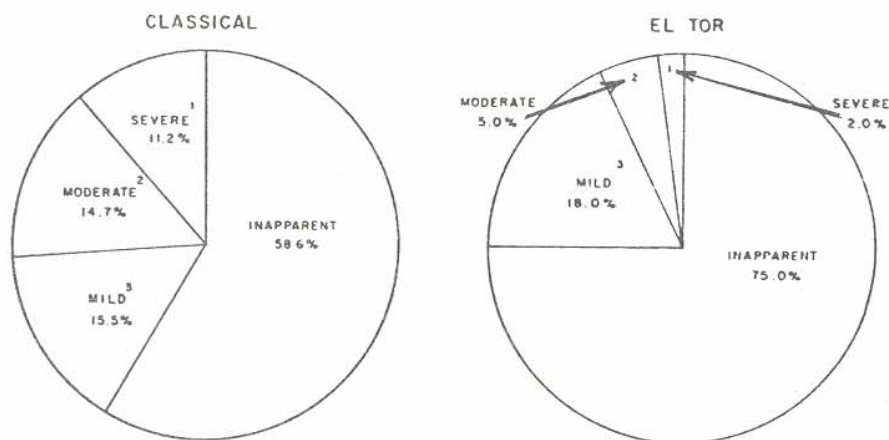
The Disease

Cholera is to gastroenteritis as the hydrogen bomb is to munitions. In its classical form, it is the most explosive form of gastroenteritis known to man, and may lead to such rapid loss of fluid and electrolytes through diarrhea and emesis that cardiovascular collapse and death may occur in a matter of hours.

Not all cholera infections, however, result in this dramatic form of the disease. In fact only a portion of infections result in any obvious disease at all. In this respect the Classical and El Tor vibrios again differ. As seen in Figure #2 the case-to-infection ratio of El Tor cholera is significantly lower than that for Classical cholera.

Figure 2

Spectrum of cholera: distribution by per cent of individuals infected with classical versus El Tor cholera. 1) Hospitalized cases of cholera gravis; 2) cases detected in outpatient clinics; 3) cases detected in bacteriological surveys. (Gangarosa, 1971)



The disease, when it does occur, develops as a result of the action of a protein exotoxin, produced by the vibrio, on the cells of the intestinal mucosa, resulting in massive efflux of water and electrolytes. These are ultimately expelled by the cholera patient as non-odorous "rice-water" stool. The intestinal epithelium remains intact even in the acute phase of the disease since the vibrio does not penetrate the bowel mucosa. Cholera enterotoxin has been purified utilizing a gel filtration technique. Through this process two separate molecules have been identified in crude toxin preparation: one having a molecular weight of 82,000 - 84,000 and possessing most of the toxic activity of the preparation and a second having a molecular weight of 57,000 - 58,000, which is highly immunogenic though relatively non-toxic. Finkelstein has named these "cholerogen" and "cholerogenoid", respectively.

Cholera toxin appears to exert its effects through its action on intestinal cyclic AMP (adenosine 3',5'-cyclic phosphate). It has been shown to increase cyclic AMP concentration of rabbit and canine small intestinal mucosa, thereby enhancing adenylyl cyclase activity. In secretory epithelia this enzyme stimulates secretion of water and electrolytes in some as yet unknown manner.

The diarrhoea that ensues results in rapid loss of sodium, potassium, chloride, bicarbonate, and water. The concentration of each of these substances in the cholera stool remains surprisingly stable throughout the course of the illness and are also quite similar from one patient to another. Mean salt concentrations in the stools of children and adult cholera patients are seen in Table #3.

Table #3
Mean Salt Concentrations
Present in Cholera Stool (meq/L)

	Child	Adult
Na ⁺	111	137
Cl ⁻	103	107
K ⁺	24.6	15
HCO ₃ ⁻	40	45

Clinical and laboratory findings in the cholera patient, for the most part, reflect water and electrolyte losses and are each reversed as quickly as these losses are replaced. These include marked dehydration characterized by hypotension, tachycardia, poor skin turgor, anuria, and hemoconcentration; acidosis secondary to massive bicarbonate losses in the stool; and relatively normal serum electrolyte determinations, indicative of the nearly isotonic stool composition.

The treatment of cholera is beautiful in its simplicity and heartening in its effectiveness. It consists simply of replacing lost fluids and electrolytes. Initially this requires a few basic calculations to determine the volume deficit. Once this has been corrected (usually at an astounding rate, with the patient receiving as many as 5 liters of fluid in the first hour, depending on size and degree of dehydration), subsequent out-put is measured and replaced. Fluid replacement has traditionally been achieved through the intravenous route. However, as a result of the work of Nalin and Cash in Dacca, it is now possible to support many cholera patients with an inexpensive, easily obtained oral preparation.

Because of the consistency of the cholera stool composition, a standard hydrating solution for children and adults may be used in treating the disease. This solution must reflect the stool composition of the patient (See Table #3). At the cholera Research Laboratory in Dacca, Bangladesh, this is the famed 5-4-1 solution for adults (containing 5 grams sodium chloride, 4 grams sodium bicarbonate and 1 gram potassium chloride). Additional potassium is required when this solution is employed for children. Tetracycline in appropriate doses, when added to this regimen has been shown to decrease the duration and volume of diarrhea, and thus intravenous fluid requirements by 60%.

The duration of immunity derived from cholera infection appears to vary depending upon the severity of the illness. Reports of reinfection appear to vary depending upon the severity of the illness. Reports of reinfection after clinically apparent cholera have appeared in the literature since 1884 when Koch first described them. Yet investigators at the University of Maryland have demonstrated solid immunity to cholera in previously infected volunteers who developed overt disease. Immunity appears to be type specific although some minor cross-protection may result from previous infection with a heterologous organism.

Control Programs

Man's most effective weapons against cholera have been his sanitation programs. Cholera spreads only in a grossly unsanitary environment through contaminated water and food. Unlike other enteric diseases it is not easily spread by person-to-person contact. This fact has been well recognized at the Cholera Research Laboratory in Dacca, Bangladesh, where intimate prolonged contact of physicians, nurses, and paramedical personnel with cholera patients over many years has resulted in almost no illness among hospital employees. Sanitary programs which provide a pure supply of drinking water

for a community and in turn educate people in the proper means of handling food and waste are not likely to have a cholera problem.

In those communities where such a program is not operative, vaccines have been used (without much success) in an effort to protect the population against cholera. Currently available cholera vaccine provides protection to only 50% of vaccinated persons for a period of 2-3 months. Furthermore, it does not prevent transmission of the disease. Many countries, however, still require cholera vaccination of travelers. Accordingly, travelers destined for endemic areas should be vaccinated within two months of their anticipated departure.

Recent outbreaks

On August 29, 1973, Italian officials notified the World Health Organization (WHO) of an outbreak of cholera in two localities south of Naples. Vibrio cholerae (El Tor, Ogawa) was the responsible organism.

As of September 15, 1973, a total of 92 confirmed cases of cholera with 5 deaths had been reported from Italy. Epidemiologic investigation by local authorities supported a thesis that infected imported mussels were the origin of this outbreak.

Recent reports of isolated cholera cases have also been received from: Mauritania (1 confirmed, 19 suspected), Sweden (2 confirmed, El Tor, Ogawa), Tunisia (15 confirmed, El Tor), United Kingdom (1 confirmed, El Tor, Ogawa), Federal Republic of Germany (1 confirmed), Niger (1 confirmed, 67 suspected).

On August 25, 1973, a 51 year old man from the Gulf Coast town of Port Lavaca, Texas, developed profuse watery diarrhea. An astute examining physician recognized the patient's illness as being compatible with cholera and was successful in isolating Vibrio cholerae (El Tor, Inaba) from the patient's stool. Appropriate intravenous therapy in combination with tetracycline resulted in complete recovery.

This represented the first case of confirmed cholera with the exception of laboratory-acquired illness, reported in the United States since 1911. The patient had no history of recent travel outside of the United States or contact with persons who had. He did have a history of a subtotal gastrectomy which may have rendered him unusually susceptible to this acid sensitive organism.

The source of the Port Lavaca case has not been identified. One hypothesis currently being investigated, however, is that the man's water

supply was contaminated by sewage from a neighboring motel. An effort is currently being made to locate recent motel guests to obtain histories, rectal swabs, and serum specimens. No additional cases have been recognized.

Summary

"The Cholera Threat" to the United States does not appear to be great with respect to the likelihood that this disease will gain a foothold and spread in this country. Proper surveillance, relatively high standards of sanitation, and a capacity for rapid definitive treatment of sporadic cases make the United States an unlikely home for the Vibrio cholerae.

Nonetheless, because of the potentially drastic consequences to the unfortunate case whose diagnosis and subsequent treatment are delayed as a result of physician ignorance; because the current seventh pandemic of cholera seems to increase in magnitude each year; and because Americans enjoy a high degree of mobility throughout the world community: it behooves physicians in this state and throughout the United States to know this disease.

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