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Diarrheal Disease Control Studies

I. Effect of Fly Control in a High Morbidity Area

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Common consent for years has ascribed to the fly a major role in the spread of enteric infections. Evidence for this belief was incomplete and did not permit an evaluation of these insects as disseminators of disease. The development in recent years of more potent insecticides, particularly DDT, made it possible to plan and carry out an experiment on a broad scale designed to answer the following questions: (1) Can flies be controlled in urban populations by insecticidal methods under the limitations of action imposed by civilian life? (2) What effect, if any, will such control have on the acute diarrheal diseases of the community, particularly those caused by specific infection with the *Shigella* and *Salmonella* groups of micro-organisms?

The basic needs for such a study were: An area with a significant amount of infectious diarrheal disease; a major fly problem; and geographic location which would permit division of the human population along natural lines into two comparable areas, one to be treated, the other to be left untreated for comparison purposes. This latter condition was essential, since it is known that variations in diarrheal disease rates greater than 100 percent occur from year to year and season to season.

Plan of Study

Such an area was found in the Lower Rio Grande Valley of Texas, and at the request of Dr. George W. Cox, State Health Officer, and the local officials, Hidalgo County was selected as the study area.

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The location of this county is shown in chart 1. The major urban areas are located in the southern one-third of the county, and nine towns are on the two major highways which intersect near the center of the area. The severe diarrheal diseases which occur in these communities are much more common in the Latin-American residents. Consequently, in selecting the two study areas, the towns were divided so that this ethnic group would be approximately equal in each. At the same time, it was desirable that the treated towns be as close together as possible in order to facilitate repeated coverage. The nine towns were, therefore, divided as follows: Group A (selected for

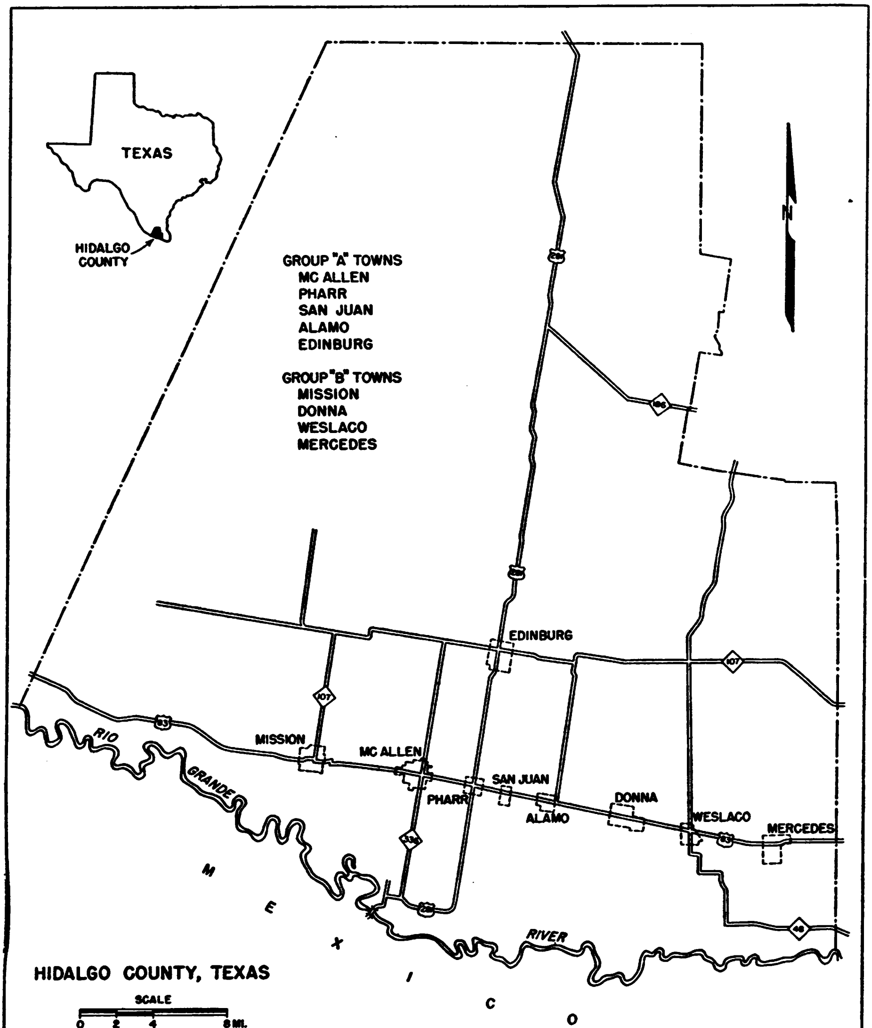

Chart 1

original treatment) included McAllen, Pharr, San Juan, Alamo, and Edinburg, centrally located. Group B (the original untreated area) consisted of Mission, on the western edge, and Donna, Weslaco, and Mercedes to the east.

Population figures by ethnic group were not available so that a census of these towns had to be made. This was done in 1946. The estimated populations are given in table 1 for 1946 and 1947. A more even division would have been possible if Alamo had been included with the untreated group B towns. Its proximity to San Juan, however, made it desirable to include this town with the treated group.

Table 1. *Estimated populations of study areas in Hidalgo County, Texas, for 1946 and 1947*

Towns	Total population		Latin Americans		Latin Americans under 2 years	
	1946	1947	1946	1947	1946	1947
Group A	46, 100	48, 800	28, 800	30, 500	2, 400	2, 500
Group B	32, 800	34, 100	25, 600	26, 500	2, 100	2, 100

The major difference between the populations of the two areas lies in a higher proportion of Anglo-Americans in the group A towns.

Three measures of the effect of fly control on human disease were decided upon: Prevalence of infection, reported diarrheal diseases, and reported mortality.

Prevalence of Infection—The chief easily identified agents causing diarrheal disease in man are the members of the *Shigella* and *Salmonella* groups of organisms. These infections are much more common among the Latin Americans of the area and, since our purpose was to measure differences in amounts of infection, sampling was confined to this group. Each town was surveyed and blocks were selected for comparability and the presence of children under 10 years of age. This age group was selected not only because of their higher infection rate but also because they were cultured more willingly. Enough blocks were chosen in each town to include a sufficient number of children for culture purposes. Each town was expected to provide at least 100 stool cultures per month, 2 small towns—100 each, 6 towns—150 each, 1 town—200, a total of 1,300 cultures equally divided between the two areas. The size of this sample was based on general population surveys in other areas which indicated that an average infection rate of approximately 4 percent could be expected. Rectal swab cultures [2] were to be taken, up to the desired number in each

[2] Studies of the acute diarrheal diseases, VI. New procedures in bacteriological diagnosis: Hardy, A. V., Watt, J., and DeCapito, T., Pub. Health Rep. 57: 521-523 (1942).

town once a month. Children were to be cultured as found by the team of workers who visited the homes. These cultures were taken without knowledge of the disease history of the individual. The determining factors as to whether or not an individual was cultured were, that they be under 10 years of age, present at the time of visit, and willing to permit this procedure.

Reported Diarrheal Disease—Official morbidity reports for diarrheal disease are notoriously inadequate. The majority of these illnesses are not seen by physicians and consequently never reach official channels, and, even when treated, only the severe cases are classed as infectious and, consequently, reported. In order to have reliable morbidity figures, it is necessary to obtain histories directly from the individuals concerned at frequent intervals. It was, therefore, planned to take a family history on all individuals residing in the areas selected for culture. These families were visited at monthly intervals by a group of lay investigators trained for this work by us and provided with special forms developed for this purpose.

Reported Mortality—While cases of diarrheal disease are under-reported, this is one of the most common causes given for the reported deaths under two years of age in this area. The third measure decided upon was the regular reported mortality from diarrheal disease as recorded by the physicians of the area. These figures would apply to the entire Latin-American population of the selected towns, whereas, the first two measures are based on a sampling technique.

The techniques used for measuring human enteric infection and disease were based on previous studies and some knowledge of what could be expected of them was available. It was believed that a definitive answer to question (2) could thus be obtained.

Question (1) presented a different problem. Accurate methods for measuring fly populations did not exist, and at the time the project was inaugurated, the extent to which urban fly control could be accomplished by modern insecticidal methods had never been determined in the absence of military expediency. Fly populations in urban areas, even in the worst of outbreaks, never consist of uniformly distributed flies. Instead, concentrations of flies are found in relatively small attractive areas. These areas are attractive because of the presence of moist, organic materials used for feeding or oviposition, or of surfaces suitable for diurnal or nocturnal resting.

In addition, when it is considered that the aggregate fly population in an urban area is composed of several hundred species of flies, each species attracted in a different degree by commonly occurring organic materials and by different types of resting surfaces, then, the difficulties in determining the total population became readily apparent. The actual identification of the dozen or more commonly occurring species requires a trained observer whose skill is greatly augmented by a thorough knowledge of the habits of each species. The habits of individual species vary according to seasonal and meteorological conditions. The common and well-named housefly, *Musca domestica* Linn., is the most commonly observed fly simply because it is the most likely to enter human habitation. Even so, its inclination to enter human dwellings is known to vary in degree according to weather and season. For example, the tendency to enter houses in advance of summer storms is a phenomenon long observed, and in the fall, when nights are cold, increasing numbers are found indoors without any increase in outdoor population.

Scudder [3] has pointed out that random fly counts, without regard to fly attractants, cannot be used because an excessively large sample would be necessary to insure the chance inclusion of even one fly-attractive area. Further, the very frequency with which these fly-attractive areas occur is, in itself, an important factor in measuring the fly population.

After preliminary experimentation Scudder's fly grill was adopted as the best currently available tool for determining relative fly abundance. In all sections of a town the blocks most likely to produce and attract flies were selected on the basis of visual evidence. These were spotted upon the city maps and the sampling blocks were then selected so that all areas of the city were represented. No exact and predetermined distribution was attempted because this, like random counts, would have included blocks of low fly potential instead of those most likely to produce or attract flies. In order to provide some coverage of areas where no blocks had been selected initially, most likely blocks were then chosen as grill stations.

Beginning April 1946, the selected blocks in all the towns, treated and untreated, were grilled weekly and the three highest counts that could be found were recorded for each block together with other pertinent information. By late May of the same year, the inspectors were proficient enough in the recognition of the common species to permit a break-down of their grill counts into species. Species counts were begun and have been used ever since. Up to this time control methods were being used on a routine basis in each treated town, scheduled so that each town would be retreated by a complete residual DDT application once every 6 weeks. At this point, grill counts in treated towns were beginning to climb rapidly in certain blocks and a new system of spot retreatment of high-count blocks was begun in order to cope with these foci of production. Also at this time

[3] Scudder, H. I.: A new technique for sampling the density of housefly populations. Pub. Health Rep., 62: 681–686, plate 1 (1947).

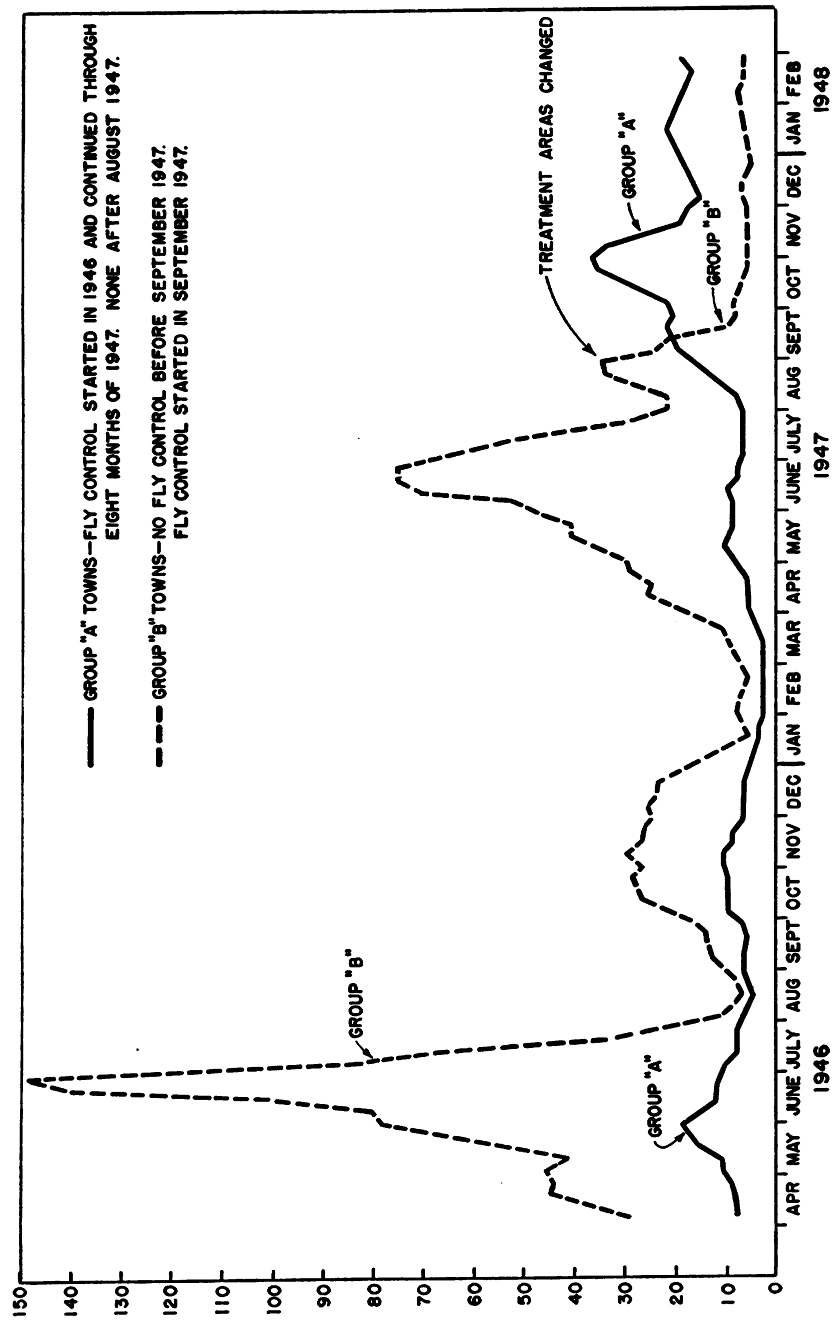

Chart 2. Three-week moving average of high grill index of total flies.

the grill blocks in the Latin-American areas in treated towns were rescheduled to allow for pre- and post-treatment inspection and this too has been continued.

An arbitrary retreatment index of ten, obtained by averaging the two highest grill counts from each block, was used throughout 1946. In January 1947, the basis for retreatment was modified to include all blocks with a single high grill count of seven or more flies. The extent of the needed retreatment was determined for each area on the basis of local grill count trends and inspection of the areas concerned. When only one survey block in an area indicated a need for retreatment, this one block and all contiguous blocks were treated, whereas, if two or more blocks were above the retreatment index, the entire area which they represented was treated unless scouting revealed that the high counts were foci which did not extend beyond the block. Since the grill blocks had the greatest fly potential and the surrounding blocks were frequently low in attractiveness, this confined treatment was not uncommon. Patterns of retreatment were soon established in the various areas. Certain blocks were shown to need almost weekly retreatment, and under special conditions favorable to fly production and attraction a few blocks required twice-weekly treatment for short periods.

Results

A more complete description of operational procedures and the results of treatment on various fly species will be presented at a later date. In this report, a three-week moving average of high grill counts is used as an index of the differences observed between the two areas. This is shown in chart 2 with a solid line connecting the weekly moving average for the group A towns. Control activities had been started in January 1946, and by April, when the grill index was adapted to this study, the differential in fly population was already apparent. Control activities were continued through the first 8 months of 1947 in these towns. In September 1947, treatment was discontinued in the group A area, and the group B towns (broken line) were placed under control.

Several major peaks were observed in the untreated area. Flies reached their highest level in June of both years, 1946 and 1947. A considerable portion of these high levels was due to heavy breeding in dumps of tomato cannery wastes adjacent to the various cities. When untreated, this breeding resulted in population pressures which caused a heavy influx of flies into the adjacent (1½ to 3½ miles) untreated towns. The drying up of these dumps and the prevailing hot, dry weather beginning in July brought about a precipitous decline in the fly index. A secondary rise was observed in the fall of 1946, became quite definite in October of that year, and was followed by a decline concurrent with cold weather in January 1947. The peak which is shown for August 1947 followed extremely heavy rains in August of that year. It was at that time that the treatment areas were changed. Within a short time the positions of the two lines had been reversed. The expected autumn rise occurred in the group A towns rather than in group B.

A considerable variation in species prevalence was noted which will be discussed in detail in another publication. In general, however, houseflies accounted for the greatest seasonal variation in total fly densities, and they were the most likely of all flies in this area to attain localized populations of such magnitude as to produce large-scale urban invasion.

The solid line (group A), shows a peak that was reached in May 1946. It was at this time that retreatment on the basis of grill index was started. The decline from this peak started well before the natural decline brought on in the group B towns by the dry weather. However, these average figures tend to conceal some localized fly outbreaks of considerable magnitude in the treated areas. These localized fly outbreaks emphasized an important consideration in insecticidal fly-control methods. Under some circumstances of heavy local

Table 2. *Results of survey cultures in selected Latin-American areas*

Month	Total survey cultures		Total *Shigella* infections		Total *Salmonella* infections		Number new *Shigella* infections		Number new *Salmonella* infections	
	Group A	Group B	Group A	Group B	Group A	Group B	Group A	Group B	Group A	Group B
1946										
March	290	51	3	2	0	0	3	2	0	0
April	604	345	9	15	1	1	9	15	1	1
May	615	617	7	29	2	4	7	29	2	4
June	640	632	14	30	1	3	14	29	1	3
July	610	626	7	19	2	3	7	19	2	3
August	640	653	10	20	5	6	9	17	5	6
September	608	608	8	16	5	3	8	14	5	3
October	637	641	10	12	7	12	9	12	7	12
November	648	651	9	12	5	5	9	11	5	4
December	634	644	7	44	1	4	7	43	1	4
1947										
January	652	656	11	26	1	3	11	24	1	3
February	645	649	4	19	1	1	3	15	1	1
March	649	648	3	6	5	2	3	7	5	2
April	657	661	2	26	5	2	1	25	3	1
May	657	654	18	49	4	2	18	45	4	1
June	656	662	21	48	0	4	20	47	0	4
July	653	656	20	40	2	6	18	38	2	5
August	642	655	14	25	6	12	13	23	6	12
September	652	646	16	42	4	17	16	40	3	13
October	657	656	22	25	7	11	21	24	5	6
November	651	648	19	28	13	12	18	23	11	10
December	652	650	10	9	5	9	10	9	5	4
1948										
January	654	649	19	19	2	3	19	15	2	3
February	653	645	20	18	0	3	19	16	0	2

breeding, insecticides alone are not sufficient to maintain desired fly control. Elimination of these breeding places is a much more effective operational procedure, and, in addition, can be done at considerably less expense. An evaluation of the relative merits of insecticidal operations versus elimination of breeding places is now under way.

A subject of current entomological interest, particularly applicable to this study, is the possible development of DDT resistant strains of flies. Our observations during the period of this report did not indicate that DDT resistant strains were being encountered.

The studies on the prevalence of *Shigella* and *Salmonella* infections in the two areas are summarized in table 2. The cultures were started

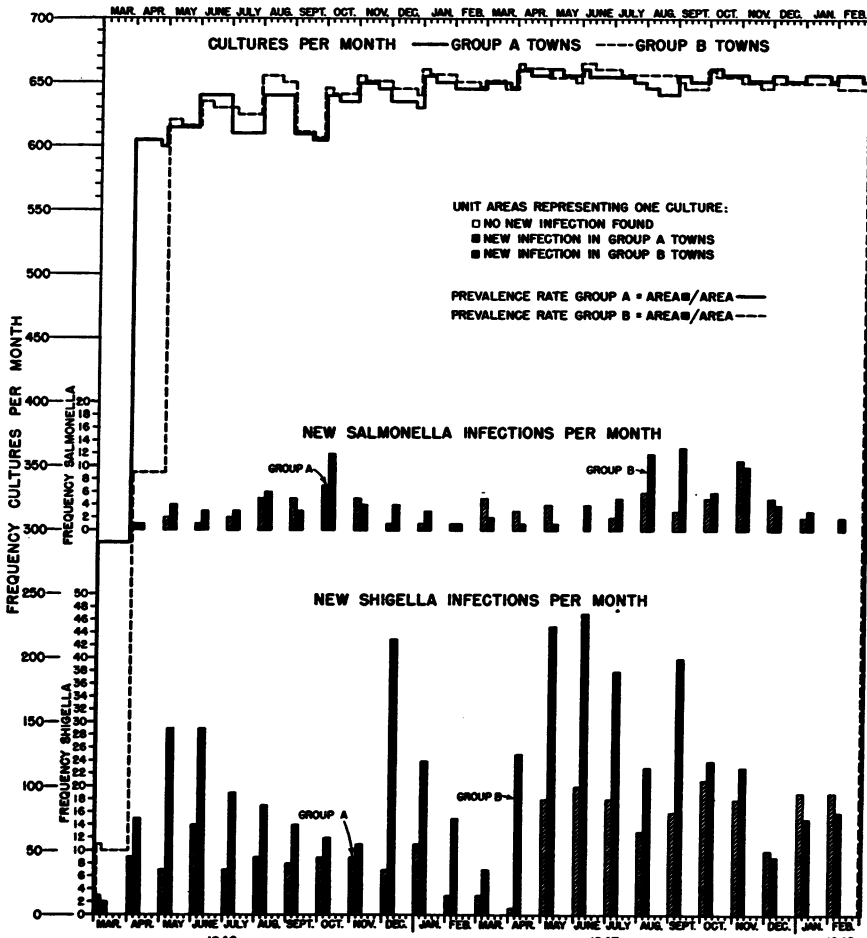

Chart 3. Histogram showing total stool cultures each month in group A and group B towns of Hidalgo County and number of new *Shigella* and *Salmonella* infections found each month.

in March 1946, and after 2 months, the desired number of cultures were regularly collected from each area. The total numbers obtained each month are sufficiently alike to permit direct comparison between group A and group B towns on the basis of infections found. Since some of the individuals were repeatedly cultured, in addition to showing total infections, the number of new infections discovered each month is also included. These do not vary greatly from the totals given but are important as an index of spread, i. e. new persons infected.

Chart 3 is a histogram showing the total stool cultures taken each month in the group A and group B areas and the new infections found in these two areas. Each stool culture is represented by a unit of area whether negative or positive. The areas which represent total cultures for the two groups of towns are superimposed on this chart. The positive cultures are separated by type and the town group from which they were obtained, and are shown as bars in each month. These are drawn to the same scale as the larger areas representing total cultures. The prevalence rate of new infections in any month is, therefore, the ratio of the area of any bar to the area which represents total cultures for that month. From the beginning, *Shigella* infections were found much more commonly in the untreated areas, and the percentage of new infections found in group B was greater each month that these towns remained untreated. With the change in treatment

Table 3. ***Cases of reported diarrheal disease and attack rates per 1,000 per annum by age group in Latin-American populations of group A and group B towns. Group A treated until September 1947; group B, September 1947 through February 1948***

Age	March 1946–August 1947				September 1947–November 1947				December 1947–February 1948			
	Group A		Group B		Group A		Group B		Group A		Group B	
	Cases	Rate per/1,000 PA	Cases	Rate per/1,000 PA	Cases	Rate per/1,000 PA	Cases	Rate per/1,000 PA	Cases	Rate per/1,000 PA	Cases	Rate per/1,000 PA
Months												
0–2	10	151	12	175	0	------	2	227	5	443	4	301
3–5	28	394	39	522	5	463	1	111	15	887	3	230
6–8	28	454	43	631	9	931	6	560	15	1,058	7	564
9–11	22	457	51	951	7	613	13	1,115	21	1,512	11	677
Years												
—1	88	356	145	547	21	476	22	546	56	995	25	455
1	100	401	188	744	22	710	25	752	53	1,022	36	731
2	51	218	89	374	10	352	12	404	22	528	14	337
3	34	142	49	198	2	63	11	341	12	288	7	162
4	17	79	26	127	1	33	7	224	13	304	4	96
5–9	45	53	53	62	7	34	9	43	14	48	8	26
10–14	12	17	24	34								
15–24	22	18	42	35	7	15	6	13	9	14	4	6
25–34	19	24	30	39								
35–54	27	27	47	44								
55+	21	48	22	51								
Unknown	6	762	2	146	0	------	0	------	0	------	0	------

in September 1947, the levels of new *Shigella* infections approached each other in the two areas; and during the last 3 months, December, January and February, a greater number of new infections was found in group A towns for the first time since the beginning of the study.

The difference in the level of *Salmonella* infection was not as great, and it was apparent that the degree of fly control obtained did not influence the spread of these organisms in the same way that it did with the *Shigella* group.

The morbidity reports obtained by monthly visits to the families in the selected population groups are reported in table 3. The marked variation in the age-specific attack rates emphasizes the need for such comparisons in studying these diseases as they occur in the general population. In table 3 these attack rates are shown for the two areas from March 1946 to August 1947, during which time group A was treated; from September 1947 to November 1947, the quarter in which group B towns were first treated and in which treatment was discontinued in group A; and from December 1947 to February 1948, a continuation of treatment in group B towns. These rates are shown graphically in chart 4, except that the first year of life is not broken down by month. The group A towns had a significantly lower attack rate from March 1946 to August 1947. This was true in all age groups. During the quarter in which treatment was changed, the rates approached each other. And in the final quarter of the study, 3 months after the treatment changed, the rates in the group B towns were lower in each age group than those observed in group A. Further, the proportionate difference between the observed rates in the two areas was essentially the same as that observed during the first 18 months of the study, but the relative positions of the two areas were completely reversed.

Graph I of chart 5 shows the monthly reported diarrheal disease attack rates per 1,000 per annum for children under 10 years of age. The solid line again represents group A towns, with group B represented by a broken line. This age group is shown, since the cultures for diarrheal disease-producing organisms were taken from the same age group and represents the same individuals. Considerably more children are included in the history of diarrheal disorders, since only a portion of the residents could be found at the time of culture. Graph II shows a 2-month moving average of the percentage of cultures found positive for new *Shigella* infections. The similarity in the trend of these two graphs is striking, considering that all infections do not necessarily result in disease, that the stool samples were not taken with any prior knowledge of the presence or absence of disease, and that there are many other causes for the symptom "diarrhea."

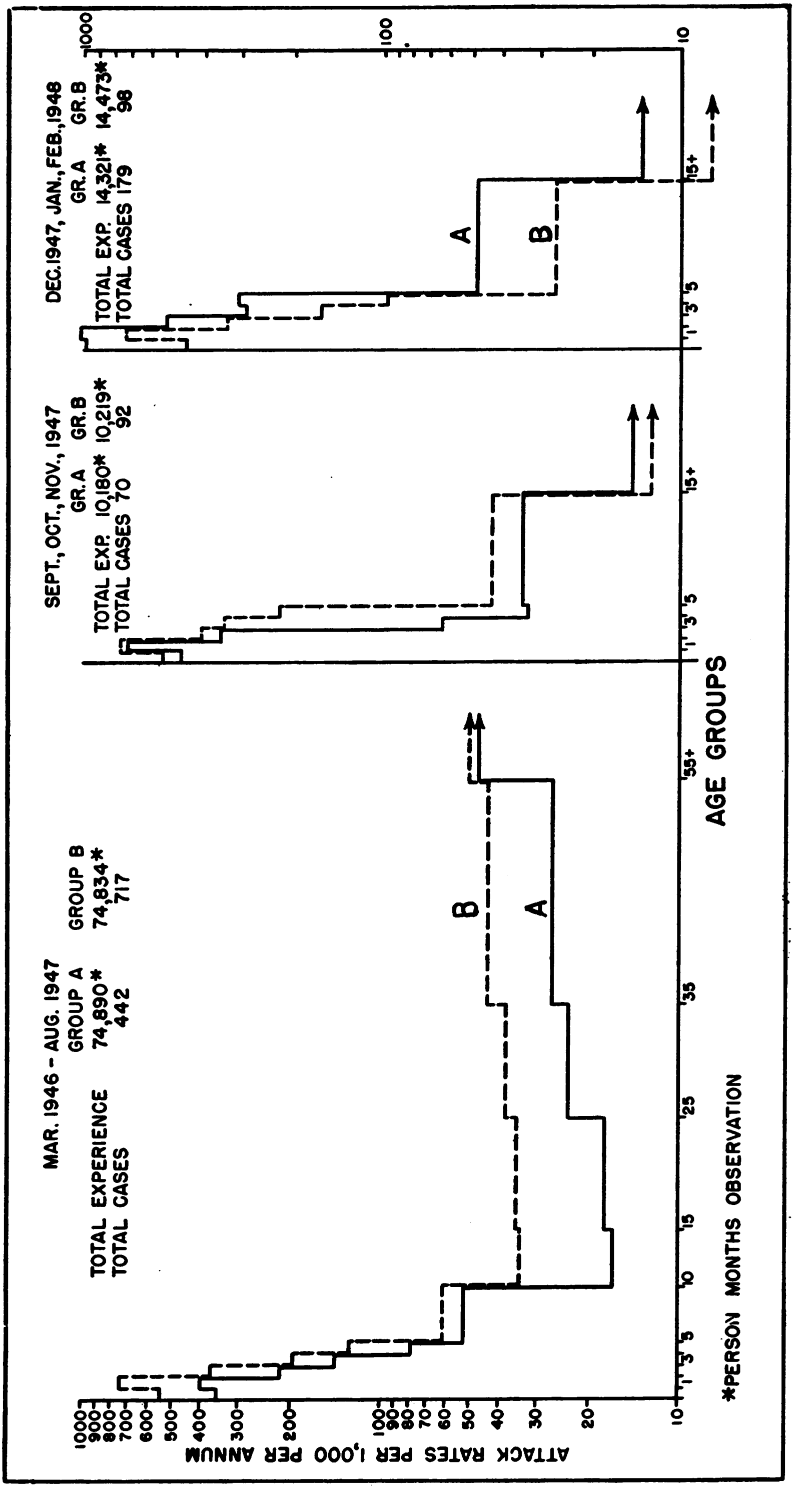

Chart 4. Attack rates of reported diarrheal disease in sample Latin-American populations by age groups.

It emphasizes the importance of *Shigella* infection as a cause of diarrheal disease significant enough to be reported by a family, and it further indicates that in areas where *Shigella* is common, reports of diarrheal disease obtained from the family at frequent intervals is a good index of the presence of these organisms.

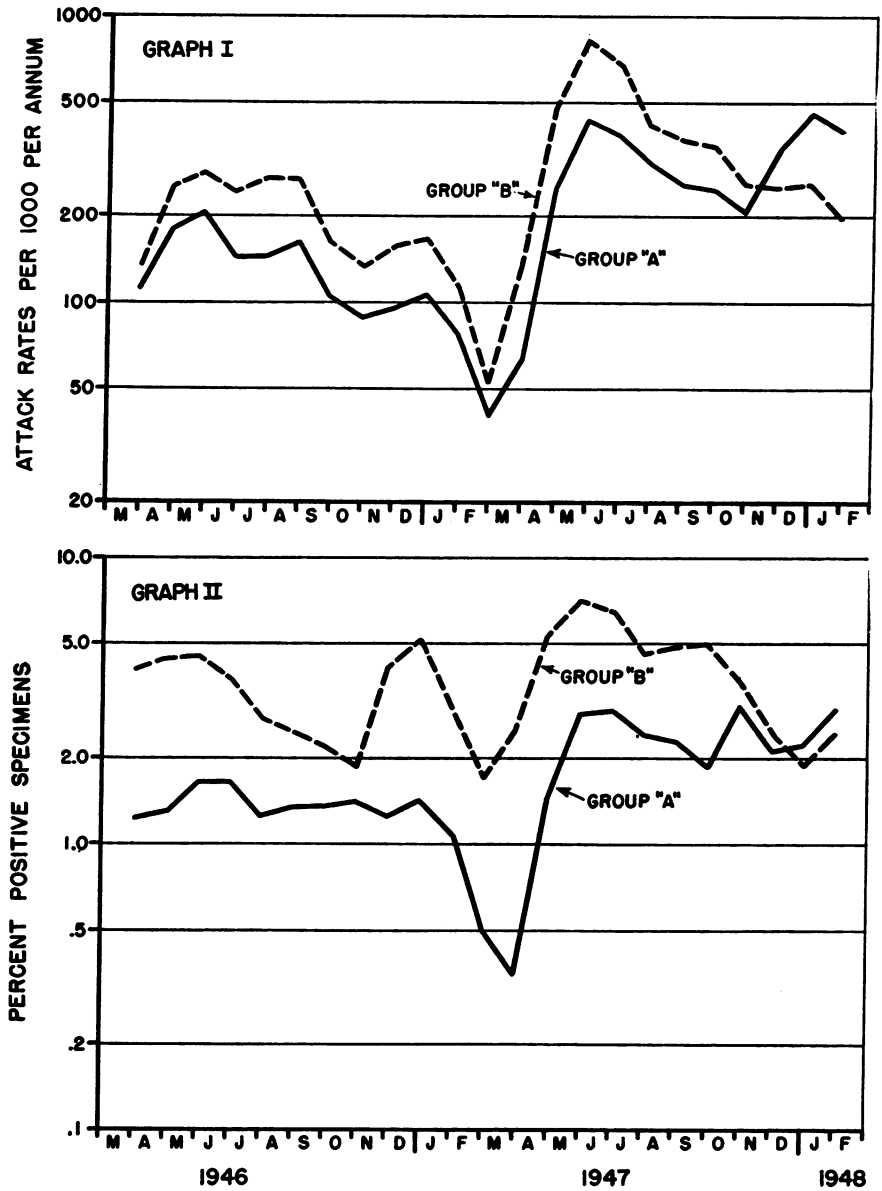

Chart 5. Graph I shows attack rate per 1,000 per annum of reported diarrheal disease in children under 10 years of age; graph II. percentage of children under 10 years with new *Shigella* infections. Both are figured on a 2-month moving average.

The final measure selected for the evaluation of fly control was a comparison of reported mortality in the two areas. Table 4 gives the reported deaths and death rates per 1,000 per annum for Latin-American children under 2 years of age in the two areas. This age and ethnic group was selected since it has the great majority of all reported diarrheal disease deaths. The figures in this chart begin with the quarter, March, April, May, 1945, and the reported deaths are divided into three groups. In group I are deaths reported as due to diarrhea and dysentery and related enteric infections such as enterocolitis. In group II are deaths with cause listed as unknown. This group includes such ill-defined causes as marasmus, feeding problem, and the like. The third group includes all other reported deaths for the age group under consideration. Each of these groups is further divided into group A and group B towns.

Up to the time fly control was started in January 1946, differences in the rates observed in the two groups of towns for all three causes were not greater than would be expected by chance alone. Beginning with the first-treatment quarter of 1946, and continuing through August 1947, the deaths and death rates for diarrhea and dysentery observed in the group A towns were lower than those observed in the group B

Table 4. *Reported deaths under 2 years of age and death rates per 1,000 per annum under 2 years in Latin-American children of group A and group B towns for selected causes*

Quarters	I Diarrhea and dysentery				II Unknown cause				III All other causes			
	Group A		Group B		Group A		Group B		Group A		Group B	
	Number of deaths	Rate*	Number of deaths	Rate*	Number of deaths	Rate*	Number of deaths	Rate*	Number of deaths	Rate*	Number of deaths	Rate*
1945												
Mar.-May	26	47.2	20	39.8	4	7.3	7	14.0	16	29.2	14	27.8
June-Aug	26	46.8	25	49.2	10	17.9	8	15.8	19	34.1	10	19.7
Sept.-Nov	5	8.8	8	15.6	9	15.9	8	15.6	14	24.7	18	35.2
1946												
Dec.-Feb.[1]	10	17.4	15	29.0	12	20.8	7	13.5	35	60.8	35	67.6
Mar.-May	8	13.7	21	40.4	0	------	9	17.2	32	54.8	28	53.6
June-Aug	15	25.3	19	36.0	8	13.5	10	19.0	20	33.7	17	32.2
Sept.-Nov	0	------	4	7.5	4	6.6	5	9.4	25	41.6	22	41.2
1947												
Dec.-Feb	5	8.2	6	11.2	4	6.6	5	9.3	17	27.8	24	44.8
Mar.-May	8	12.9	19	35.0	6	9.7	9	16.6	24	38.7	9	16.6
June-Aug	23	36.6	30	54.8	5	8.0	9	16.4	13	20.7	22	40.4
Sept.-Nov.[2]	13	20.4	11	19.9	8	12.6	4	7.2	14	22.0	16	29.0
1948												
Dec.-Feb	17	26.3	1	1.8	19	29.4	8	14.4	29	44.8	26	46.8

*Rate per 1,000 per annum under 2 years of age.
[1] Fly control started this quarter in group A towns. No fly control in group B towns.
[2] Fly control started Sept. 1947 in group B towns. No fly control in group A towns.

towns for the corresponding quarter. Similarly, when the change in treatment areas was made in September 1947, the observed death rates were essentially equal in that quarter, and in the succeeding quarter the death rate was higher in the group A towns. A similar situation is noted in those causes listed as unknown and ill-defined. The rates in the two areas were comparable during 1945; then with the onset of treatment, the rates were higher in each quarter in the group B towns until treatment was reversed, at which time the level of death rates was also reversed. It would appear from this that at least some of the deaths due to ill-defined causes were actually specific enteric infections. There is no indication that fly control had any influence on death rates from all other causes. Such variations as do occur are at random and such as would be expected by chance alone in any series of figures of comparable size.

Discussion

The data presented in this paper constitute a summary of the results obtained in a large scale attempt to evaluate the effect of fly control on acute diarrheal diseases.

Of the two questions proposed at the beginning of the study the answer is clear for the second question, "What effect, if any, will such control have on the acute diarrheal diseases?" In the area of high morbidity studied, a significant reduction in the amount of infection, disease and death resulted from the degree of control established. The effect on *Shigella* infections was greater than on infections with the *Salmonella* group of organisms. Thus, fly control would have greater potential value as a health measure in those areas where *Shigella* infections predominate as a cause of acute diarrheal disease.

A more qualified answer must be given to the question "Can flies be controlled in urban populations by insecticidal methods?" because in answering it affirmatively we also raise a very important practical question, "What is the best way to control flies?" Flies can be controlled by insecticidal methods, but the reversal of the fly curves in a matter of days after the treatment areas were changed shows all too clearly that chemical insecticides are temporary expedients at best. In our experience something more basic, particularly the elimination of man-made breeding places, must be done if the full effect of fly control on disease is to be brought about. The place that insecticides should occupy in a fly-control program will not be clearly established until their use has been studied in conjunction with the various elements of sound municipal housekeeping.

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Particular thanks are extended to the nurses of the County Health Unit for their help in obtaining stool cultures; the Commissioners Court for providing headquarters office space, the city of Weslaco for laboratory space, and the American Legion (Pharr) for use of their property for warehouse and other storage facilities.

The individuals, members of the Public Health Service and others, who participated and assisted in these investigations are too numerous to detail. Special mention should be made, however, of Dr. J. W. Mountin, Assistant Surgeon General, Public Health Service, and Dr. A. V. Hardy, Director of Laboratories, Florida State Department of Health, who proposed and initiated these studies.

Is Diabetes Mortality Increasing?

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The official mortality statistics for the United States give no indication of the decline in diabetes mortality which was expected after the discovery of insulin in 1922. On the contrary, the recorded crude death rate for diabetes has continued to rise without interruption, despite the fact that there has been a widespread use of insulin for more than 20 years.

The diabetes death rate in recent years has been almost 50 percent higher than that for the pre-insulin years. The upward trend in the crude death rate, however, conceals the efficaceous results of insulin therapy in the population at the younger ages (see chart). The diabetes death rate for each age group under 45 shows a fairly sharp break in the trend in 1923 when the diabetes death rate began to decline. The decrease in diabetes mortality after 1923 appears to be a positive reflection of the use of insulin in diabetes therapy.

The diabetes death rates based on the population present in the continental United States (*de facto* population) for the age groups 15–24 and 25–34 years during the war years show a rise in mortality. This is particularly true of the rate for the 15–24 year age group. However, diabetes death rates based on the total population, including the armed forces overseas (*de jure* population), for these age groups indicate a general continuation of the declining mortality trend during the war years among those in the younger ages. Since relatively few deaths [1] from diabetes occurred outside of the continental United States during the war years, diabetes death rates, unlike many other death rates, should be properly computed on a *de jure* population base.

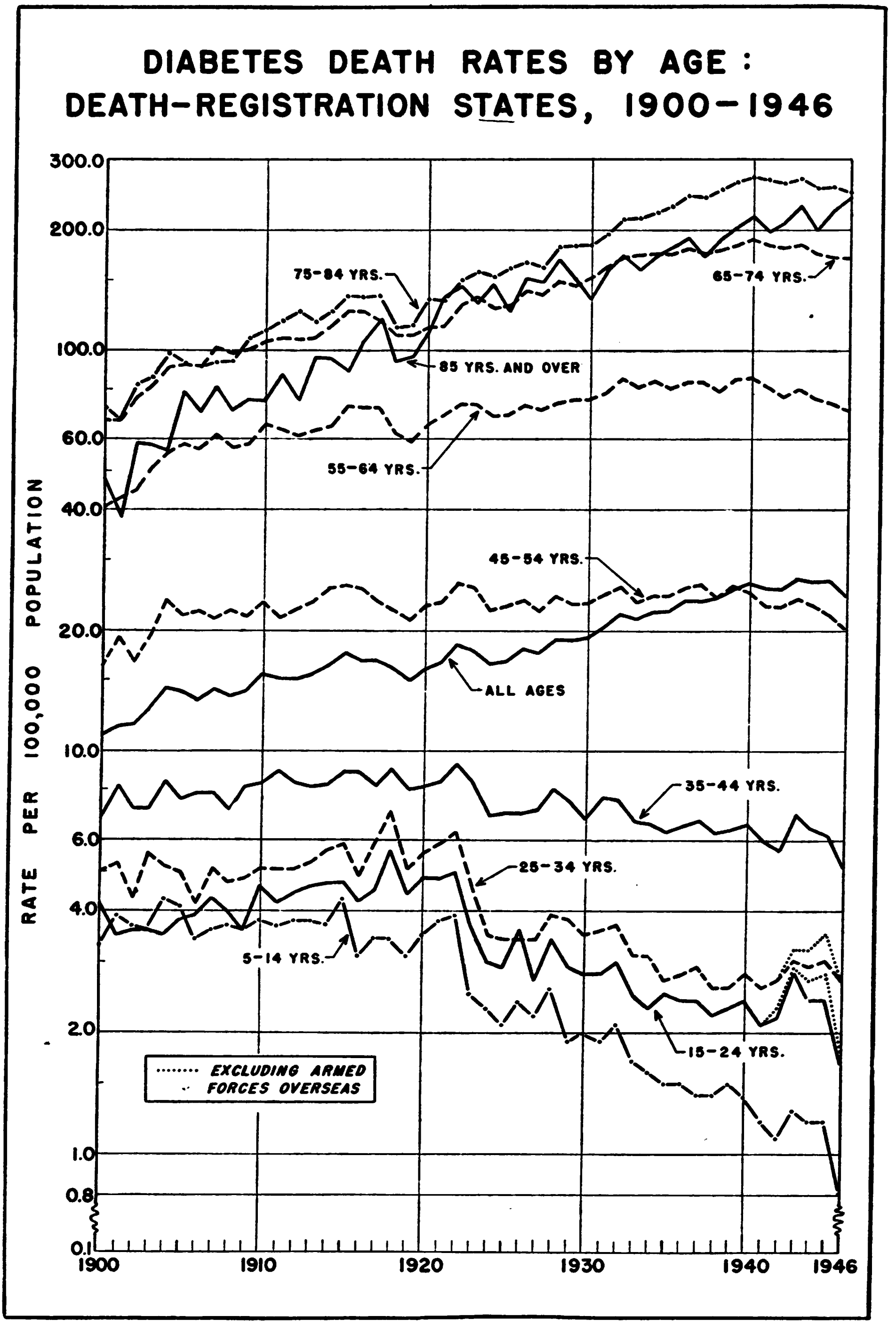
At the older ages, the mortality picture is not favorable. It would appear from the age-specific death rates that insulin therapy has not altered in any way the rising diabetes mortality evident since 1900 when mortality data first become available annually for the United States Death Registration Area. Part of the increasing death rate in the older ages may be attributed to the prolongation of life of the young diabetic through the use of insulin. The number of such cases, however, is not sufficient to influence greatly the diabetes death rate for all of the age groups over 45 for the past 23 years. Another factor to be considered is the decline in general mortality which permitted more people to survive to an age of higher diabetes prevalence. This, however, would not increase the diabetes death rate for these ages, if the true mortality risk for diabetes did not change. It does not seem at all reasonable to assume that the true mortality risk, whatever it may be, has been increasing for a disease like diabetes.

A major consideration in the interpretation of statistics of diseases such as diabetes is how well the disease is recognized or detected, and hence reported. It is well known that there has been an increasing recognition of the disease. Also, there are indications of increased reporting of diabetes on the death certificates. This in itself is significant, but the effect of such an increase in reporting would probably not result in too great an overstatement of the diabetes death rate, were it not for a certain practice in the cause-of-death classification procedure. This procedure may result in statistics that overstate the present diabetes death rate by as much as 100 percent.

There would be no problem, insofar as the coding procedure is concerned, if only one cause of death were reported on the death certificate. In such a case, the cause reported is assigned as the primary cause of death. However, when two or more causes are certified on the death certificate, it becomes necessary to select one of them as the "primary" cause of death. Because an increasing proportion of death certificates return two or more causes, and because of the chronic nature of diabetes, the joint-cause coding procedure assumes great importance when diabetes is certified as one of the causes of death.

If all of the medical certifications of diabetes specified that diabetes was the direct cause of death, the resultant statistics would have considerable significance. However, this type of certification is not obtained in most of the cases. Diabetes mellitus is frequently re-

[1] Statistics on deaths from diabetes occurring overseas furnished through the courtesy of the Surgeons General of the Army and Navy Departments showed a total of less than 20 deaths annually between 1940 and 1946.


DIABETES DEATH RATES BY AGE: DEATH-REGISTRATION STATES, 1900-1946
RATE PER 100,000 POPULATION
300.0
200.0
100.0
60.0
40.0
20.0
10.0
6.0
4.0
2.0
1.0
0.8
0.1
1900
1910
1920
1930
1940
1946
75-84 YRS.
65-74 YRS.
85 YRS. AND OVER
55-64 YRS.
45-54 YRS.
ALL AGES
35-44 YRS.
25-34 YRS.
5-14 YRS.
15-24 YRS.
EXCLUDING ARMED FORCES OVERSEAS

ported in the space provided in the death certificate for "Other conditions," i. e., conditions existing coincidentally which might have contributed to the risk of dying but were not related in any clear-cut manner to the immediate or underlying cause of death.

According to the present method of selecting the primary cause of death, cognizance is not taken of the distinction made in the physician's statement that a particular cause was not related to the immediate or underlying cause of death but might have contributed to the risk of dying. In the case of diabetes this frequently results in primary cause assignments that cannot be justified on a medical basis. For example, a physician in attendance on a diabetic with heart disease may feel that the diabetes was a contributory factor to the risk of dying even though diabetes was under insulin control throughout the period of illness from heart disease. In such a case, he would report the heart disease as the underlying cause of death and the diabetes as a contributory cause. In the cause-of-death classification, however, diabetes would be selected as the primary cause over heart disease because of its stronger priority weight.[2] Thus, diabetes is tabulated as the primary cause of death despite the fact that the certifying physician intended that the diabetes be recorded only as a contributory factor in the death.

It was stated earlier that the coding practice described above may overstate the diabetes death rate by as much as 100 percent.[3] This statement is based on a study of 10,048 death certificates from Maryland and up-State New York made by the United States Committee on Joint Causes of Death. Of the total death certificates studied, diabetes mellitus appeared on 341 medical certifications. It is significant that in 309 death certificates diabetes mellitus was reported jointly with some other cause or causes, and in only 32 deaths, or about one-third of 1 percent of the total certificates studied, diabetes appeared as the sole cause of death. When these death certificates were coded by the present procedure of selecting the primary cause of death, diabetes was designated as the primary cause in 294 deaths. On the other hand, when reports of diabetes given as a contributory cause of death (i. e., certified in the space for "Other conditions") were ignored in the classification, diabetes was selected as the cause of death in 150 cases. This would mean that in 144 cases (the difference in results of the two coding procedures), diabetes was selected as the primary cause of death even though it was presumably not certified as the underlying

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[2] For details of the cause-of-death classification procedure now in use, see the Manual of Joint Causes of Death (fourth revision), Government Printing Office, Washington, 1940 and the Instruction Manual for Coding Causes of Death, 1947, National Office of Vital Statistics.

[3] It should be mentioned here that diabetes was one of the few causes of death so seriously affected by the coding procedure.

cause of death. If, in these cases, the physicians intended to report diabetes as an existing concomitant condition that contributed indirectly to the risk of dying, there would be little justification for selecting diabetes as the primary cause of death. Such a practice has had the effect of grossly exaggerating the recorded diabetes death rate.

Has the distortion produced by the coding practice been constant over the years or has it been increasingly exaggerating the course of diabetes mortality? The data available would indicate the latter to be true. For one thing, the proportion of death certificates reporting more than one morbid condition has been increasing. As may be seen from the data in the accompanying table, only 34.9 percent of the death certificate filed in the death-registration area in 1917 reported more than one cause of death. By 1940, this proportion increased to 55.4 percent. With the increase in the percentage of death certificates reporting more than one cause, there has also been an increase in the proportion of death certificates in which diabetes was reported jointly with some other cause. In the death returns for 1917, 45 percent of the deaths with mention of diabetes had some other cause reported jointly with diabetes. In 1925, 1936, and 1940, this proportion was 58, 73, and 76 percent, respectively, evidencing increased competition between diabetes and other causes of death for inclusion in the death statistics. If the sample of present death certifications is any indication, most of the increase involved reporting of diabetes as a contributory cause and not as the underlying cause of death.

Total number of deaths and proportion of death certifications reporting two or more causes, and number of deaths assigned to diabetes as primary and secondary causes: United States Death Registration Area, 1917, 1925, 1936, and 1940

	1940 (48 States)	1936 (48 States)	1925 (40 States)	1917 (27 States)
Total number of deaths	1,417,269	1,479,228	1,191,809	981,239
Proportion of certificates with more than one cause of death (percent)	[1] 55.4	59.5	44.0	34.9
Number of deaths assigned to diabetes as primary cause [2]	35,015	30,406	17,385	12,734
Number of deaths, diabetes only cause reported	5,352	5,881	6,424	6,654
Number of deaths, diabetes reported jointly with other causes	29,663	24,525	10,961	6,080
Number of deaths to which diabetes was the contributory cause	3,991	3,101	1,425	758

[1] The rules used in coding secondary causes of death in 1940 differed from those in the preceding years. If the same rules had been followed in 1940 as in earlier years, the proportion of certificates reporting more than one cause would have been somewhat higher than 55.4 precent.
[2] Diabetes deaths appearing in the official mortality statistics.

This raises the question as to whether or not diabetes should ever be tabulated as a "primary" cause of death when reported as a "contributory" cause of death. Those interested in diabetes as a problem would probably wish to see recorded separately all deaths in which diabetes is involved. However, as a practical matter, it is not possible to tabulate routinely every death of a diabetic showing diabetes as a primary or as a contributory cause.

From the data presented here, there is reason to believe that since the introduction of insulin the "true" diabetes mortality trend has been downward rather than upward as shown by the official statistics. Unless the cause-of-death coding practice is modified in regard to diabetes, death statistics will continue to be a misleading index of the mortality risk from diabetes. In this connection, preparations are being made to introduce in 1949 a new procedure for selecting the cause of death to be tabulated. This procedure was recommended by the United States Committee on Joint Causes of Death and by the Expert Committee of the World Health Organization (Interim Commission) and adopted for international use by the International Conference for the Sixth Decennial Revision of the International Lists of Diseases and Causes of Death held in Paris April 26–30.

The adoption of the new procedure will place a greater responsibility on the physician to certify causes of death in such a way that medical opinion can be relied upon to select the cause of death to be tabulated. It is expected that diabetes mortality statistics, starting in 1949 when the revised joint-cause procedure will be introduced, will be a better index of diabetes mortality than in the past.

The introduction of any major revision in classification procedure will, of course, affect the comparability of statistics. This disruption in the continuity of mortality trends for certain causes will be disturbing, but it is a price that has to be paid for more useful and meaningful mortality data. Insofar as diabetes mellitus is concerned, it is likely that relatively little can be said about its past mortality trend. As for other causes of death, there will be some shift in the base line than can and will be measured, but it will not be of the magnitude expected in the case of diabetes mortality statistics. Although it is anticipated that there will be numerous problems arising from the change in the coding procedure in 1949, the change will open up the possibility of obtaining in the future cause-of-death statistics which will be on a much firmer medical basis.

INCIDENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED SEPTEMBER 18, 1948

Summary

A net increase in the incidence of poliomyelitis of 313 cases was reported, from 1,527 last week to 1,840 for the week ended September 18 (5-year medium 1,020). For the corresponding week in 1946 a decline from 1,726 to 1,620 occurred. However, increases were recorded, though small in some instances, in 15 of the corresponding weeks of the past 21 years.

Of the 34 States and the District of Columbia which reported currently 10 or more cases, 23 showed an aggregate increase of 443 cases (1,012 to 1,455), 11 (including the District of Columbia) reported a decline from 425 to 321, and one (Alabama) reported 13 cases each week. Of the 23 States reporting increases, the most important were California, 326 (last week 205), 13 States in the Middle Atlantic and North Central areas, 985 (last week 723), and 5 South Atlantic and South Central States, 86 (last week 48). The 20 States reporting currently more than 19 cases are as follows (last week's figures in parentheses): *Increases*—New York 115 (95), New Jersey 71 (50), Pennsylvania 74 (51), Ohio 149 (79), Indiana 42 (33), Illinois 99 (71), Michigan 71 (57), Minnesota 115 (101), Iowa 90 (81), South Dakota 55 (10), Nebraska 60 (56), Kansas 32 (31), Tennessee 38 (13), Oregon 20 (12), California 326 (205); *decreases*—Wisconsin 46 (48), Missouri 28 (32), Virginia 41 (46), North Carolina 76 (112). Texas 42 (57).

The total since March 20 is 15,678, as compared, respectively, with 5,005 and 15,313 for the corresponding periods of 1947 and 1946, and a 5-year median of 7,612.

Of 11 cases of Rocky Mountain spotted fever reported for the current week (last week 6, 5-year median 12), 2 occurred in Ohio, 4 in Georgia, and 1 each in 5 other South Atlantic and South Central States. Two cases of smallpox were reported—1 each in Wisconsin and Mississippi.

Deaths recorded in 93 large cities in the United States during the week totaled 8,179, as compared with 7,842 last week, 8,269 and 8,246, respectively, in the corresponding weeks of 1947 and 1946, and a 3-year (1945–47) median of 8,246. The total for the year to date is 352,334, as compared with 351,065 for the corresponding period last year. Infant deaths totaled 607, last week 609, 3-year median 701. The cumulative figure is 25,380, same period last year 28,340.

Telegraphic case reports from State health officers for week ended September 18, 1948

(Leaders indicate that no cases were reported)

Division and State	Diphtheria	Encephalitis, infectious	Influenza	Measles	Meningitis meningococcal	Pneumonia	Poliomyelitis	Rocky Mt. spotted fever	Scarlet fever	Smallpox	Tularemia	Typhoid and paratyphoid fever [d]	Whooping cough	Rabies in animals
NEW ENGLAND														
Maine	-------	-------	-------	15	-------	1	1	-------	6	-------	-------	1	3	-------
New Hampshire	-------	-------	-------	6	-------	-------	1	-------	-------	-------	-------	-------	-------	-------
Vermont	-------	-------	-------	7	-------	-------	-------	-------	-------	-------	-------	-------	2	-------
Massachusetts	8	-------	-------	57	1	8	16	-------	26	-------	-------	-------	61	-------
Rhode Island	-------	-------	-------	-------	-------	6	1	-------	-------	-------	-------	-------	2	-------
Connecticut	1	-------	-------	4	1	13	5	-------	2	-------	-------	-------	1	-------
MIDDLE ATLANTIC														
New York	4	-------	[b] 1	73	2	115	115	-------	[c] 34	-------	-------	7	151	13
New Jersey	3	-------	2	29	6	33	71	-------	9	-------	-------	3	74	2
Pennsylvania	2	-------	([b])	40	2	-------	74	-------	27	-------	-------	6	73	2
EAST NORTH CENTRAL														
Ohio	7	-------	2	17	1	19	149	2	28	-------	-------	3	55	6
Indiana	3	1	1	4	1	9	42	-------	7	-------	-------	3	2	4
Illinois	1	2	-------	7	4	191	99	-------	22	-------	-------	2	51	-------
Michigan [a]	-------	-------	-------	42	3	20	71	-------	25	-------	-------	4	52	16
Wisconsin	-------	1	2	48	-------	2	46	-------	7	1	-------	-------	32	-------
WEST NORTH CENTRAL														
Minnesota	-------	-------	-------	1	-------	18	115	-------	9	-------	-------	-------	7	-------
Iowa	-------	-------	-------	1	-------	-------	90	-------	2	-------	2	-------	7	-------
Missouri	6	-------	-------	3	-------	14	28	-------	7	-------	2	1	1	-------
North Dakota	1	-------	-------	3	-------	-------	12	-------	3	-------	-------	-------	1	-------
South Dakota	1	-------	-------	-------	-------	-------	55	-------	-------	-------	-------	-------	-------	-------
Nebraska	1	1	7	-------	-------	-------	60	-------	16	-------	-------	-------	2	-------
Kansas	3	1	-------	4	-------	10	32	-------	8	-------	-------	-------	9	-------
SOUTH ATLANTIC														
Delaware	-------	-------	-------	-------	-------	-------	8	-------	-------	-------	-------	-------	-------	-------
Maryland [a]	1	-------	-------	13	1	31	11	-------	[c] 7	-------	-------	1	14	-------
District of Columbia	-------	-------	-------	4	-------	8	12	-------	5	-------	-------	-------	4	-------
Virginia	1	1	200	20	2	15	41	1	4	-------	1	5	8	3
West Virginia	3	-------	4	-------	1	-------	10	-------	6	-------	-------	1	8	-------
North Carolina	9	-------	-------	3	2	-------	76	1	18	-------	-------	1	30	-------
South Carolina	47	1	174	18	-------	46	17	-------	1	-------	-------	5	44	6
Georgia	15	-------	-------	4	1	7	7	4	19	-------	1	2	3	4
Florida	16	-------	1	3	-------	21	10	-------	6	-------	-------	4	26	2

See footnotes at end of table.

Telegraphic case reports from State health officers for week ended September 18, 1948—Continued

Division and State	Diphtheria	Encephalitis, infectious	Influenza	Measles	Meningitis meningococcal	Pneumonia	Poliomyelitis	Rocky Mt. spotted fever	Scarlet fever	Smallpox	Tularemia	Typhoid and paratyphoid fever [d]	Whooping cough	Rabies in animals
EAST SOUTH CENTRAL														
Kentucky	4			19	4	25	11		14			6	38	11
Tennessee	6		8	11	4	39	38	1	34		2	6	39	
Alabama	19		4	5	1	10	13	1	8		1	1	10	6
Mississippi [a]	7		3	3		26	15		3	1	1		5	
WEST SOUTH CENTRAL														
Arkansas	3		27	1	2	11	12		3		1	8	18	2
Louisiana			1	1		18	7					4		
Oklahoma			11			5	19		6		1	1	7	1
Texas	13		414	128	2	73	42	1	11		1	6	70	22
MOUNTAIN														
Montana	1		24	1	1		2		3			2	8	
Idaho			7	4			4		[c] 3			1	4	
Wyoming		1				3	4							
Colorado	2		3	6		13	7		6			7	15	
New Mexico	2		1	2		7	4		1			1	2	
Arizona			15	4		15	11					2	1	
Utah [a]	3			13		3	11						13	
Nevada														
PACIFIC														
Washington	2		2	16	1	2	19		7			1	13	
Oregon			4	21		14	20		7				15	
California	4	1	8	48	3	14	326		37			10	42	1
Total	199	10	926	709	46	865	1,840	11	447	2	13	105	1,023	
Median, 1943–47	301	22	623	535	93		1,020	12	893	2	14	159	2,363	
Year to date, 37 weeks	5,964	400	144,358	522,938	2,436		16,028	478	57,420	53	731	2,565	61,208	
Median, 1943–47	8,312	463	194,096	540,807	6,495		8,009	416	101,240	286	640	3,504	93,369	
Seasonal low week ends	(27th) July 10		(30th) July 31	(35th) Sept. 4	(37th) Sept. 18		(11th) Mar. 20		(32d) Aug. 14	(35th) Sept. 4		(11th) Mar. 20	(39th) Oct. 2	
Since seasonal low week	1,354		5,543	1,524	3,218		15,678		1,804	3		2,092	92,474	
Median, 1943–47	2,048		3,899	1,030	8,947		6,718		3,639	4		2,880	115,416	

[a] Period ended earlier than Saturday.
[b] New York City and Philadelphia only, respectively.
[c] Including cases reported as streptococcal infections and septic sore throat.
[d] Including paratyphoid and salmonella infections; currently reported separately, as follows: New York (salmonella infection) 4; Pennsylvania (salmonella infection) 1; Ohio 1; Michigan, 1; Virginia, 2; Colorado, 6; California, 5.

Alaska: Erysipelas, 1; rheumatic fever, 2.
Territory of Hawaii: Measles, 3; lobar pneumonia, 2; scarlet fever, 1; whooping cough, 4.

DEATHS DURING WEEK ENDED SEPT. 11, 1948

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Sept. 11, 1948	Corresponding week, 1947
Data for 92 large cities of the United States:		
Total deaths	7,818	8,250
Median for 3 prior years	8,249	
Total deaths, first 37 weeks of year	343,370	342,044
Deaths under 1 year of age	607	736
Median for 3 prior years	688	
Deaths under 1 year of age, first 37 weeks of year	24,712	27,547
Data from industrial insurance companies:		
Policies in force	70,904,450	67,164,412
Number of death claims	9,728	11,963
Death claims per 1,000 policies in force, annual rate	7.2	9.3
Death claims per 1,000 policies, first 37 weeks of year, annual rate	9.4	9.4

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—4 weeks ended August 28, 1948.—During the 4 weeks ended August 28, 1948, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Chickenpox	13	Poliomyelitis	6
Diphtheria	45	Syphilis	148
Dysentery	8	Tetanus	8
Gonorrhea	258	Tuberculosis (all forms)	693
Influenza	1,892	Typhoid fever	7
Malaria	89	Typhus fever (murine)	2
Measles	109	Whooping cough	101

Poliomyelitis Incidence Exceeds 1946 Figure

After several weeks of fluctuations that appeared to indicate a leveling off of the incidence of poliomyelitis for the 1948 season (see accompanying graph), the number of new cases reported from the country as a whole jumped to 1,841 in the week ending September 18. This weekly incidence is slightly greater than any experienced during the 1946 epidemic. In the weeks ending August 17 and August 24, 1946, there were 1,815 and 1,806 cases reported. The current total is, therefore, higher than any recorded for a single week as long as case statistics have been available in this form, that is, for 20 years. However, the reporting of poliomyelitis cases is considerably more complete now than it was even 10 years ago, and it is likely that more cases of a mild, nonparalytic type are being recognized and reported.

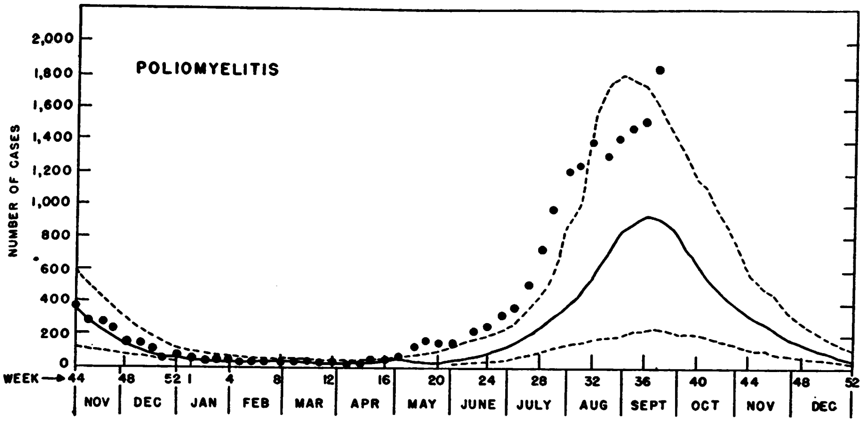
In general, the areas responsible for this sudden increase are the middle Atlantic and north central States. However, the incidence in California, which had been fluctuating somewhat irregularly in recent weeks, also rose sharply. On the other hand, cases in the other two States, Texas and North Carolina, which with California had been responsible for over a third of all cases reported during August, continued to decline. In North Carolina the number of new cases reported each week on the basis of latest reports available is scarcely half what it was during the latter part of July. The Texas incidence was the third highest in the country up through the middle of August, but as the epidemic began to subside there the weekly totals for that State were exceeded, first by New York, Ohio, and Minnesota, and then by other States.

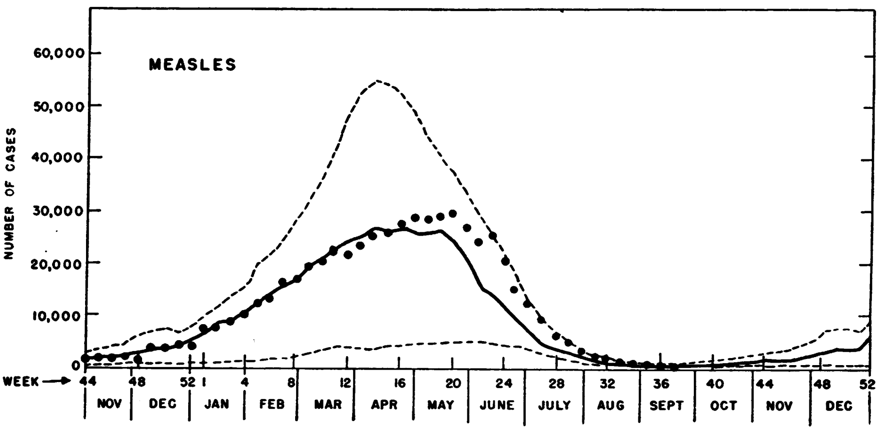
Statistical evidence indicates that what was previously a fairly localized epidemic with centers in North Carolina and California, and with some excess in Texas as well, has now spread to a number of other parts of the United States. The sections of the country which have so far been spared are: New England and the mountain States plus scattered States in other regions. Up until the week ending September 18 the east north central States had been little involved, but then the number of cases jumped about 40 percent above the previous week. In the same week the total reported in the middle Atlantic States rose one-third, and the total in California by about 60 percent.

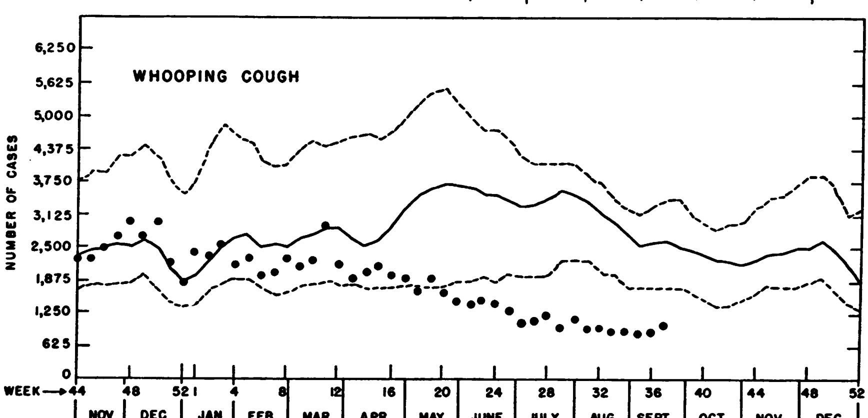
In the past 10 years the peak week for reported incidence of poliomyelitis for the country as a whole has never been later than the 37th week of the year. The last week for which current data are shown on the accompanying graph (the week ending September 18) is the 37th week of 1948. Thus, if the number of cases should be found to have increased again in the following week, it will be an indication of an unusually late peak in poliomyelitis incidence this year.

Communicable Disease Charts

All reporting States, November 1947 through September 18, 1948







The upper and lower broken lines represent the highest and lowest figures recorded for the corresponding weeks in the 7 preceding years. The solid line is the median figure for the 7 preceding years. All three lines have been smoothed by a 3-week moving average. The dots represent numbers of cases reported for the weeks of 1948.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended August 28, 1948.—During the week ended August 28, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		8		10	83	7	11	16	10	145
Diphtheria		1		6	1	1	1	2		12
Dysentery, bacillary				1						1
Encephalitis, infectious				1						1
German measles					9			3	2	14
Influenza		26			17	1			5	49
Measles		1		35	81	15	6	10	8	156
Mumps		5		16	50	9	10	7	1	98
Poliomyelitis		2	1	1	25	9	4	34	3	79
Scarlet fever		1	2	7	14	5	2	3	7	41
Tuberculosis		16	3	42	30	39	16		32	178
Typhoid and paratyphoid fever				5	2			2	4	13
Undulant fever				1	2	1			2	6
Venereal diseases:										
Gonorrhea	4	23	9	105	85	42	23	36	71	398
Syphilis	2	9	6	93	43	3	10	12	16	194
Whooping cough		1		46	7	15	1	6	4	80

CUBA

Habana—Communicable diseases—4 weeks ended August 28, 1948.—During the 4 weeks ended August 28, 1948, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths
Diphtheria	9	0
Measles	9	0
Tuberculosis	1	0
Typhoid fever	6	1

Provinces—Notifiable diseases—4 weeks ended August 28, 1948.—During the 4 weeks ended August 28, 1948, cases of certain notifiable diseases were reported in the provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana[1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	4	12	6	19		20	61
Diphtheria		10	3	2		2	17
Leprosy		3		1		2	6
Malaria	1	5			2	15	23
Measles		7				1	8
Poliomyelitis		1					1
Scarlet fever		1					1
Tuberculosis		6	9	7	13	19	54
Typhoid fever	3	13	3	33	4	37	93
Typhus fever (murine)		1	1				2

[1] Includes the city of Habana.

JAPAN

Encephalitis, Japanese "B".—During the period July 20–August 31, 1948, 4,496 cases of Japanese "B" encephalitis, with 777 deaths, were reported in Japan. The outbreak is stated to have begun in Tokyo, where 1,802 cases with 363 deaths occurred during the 6-week period.

MADAGASCAR

Notifiable diseases—July 1948.—Notifiable contagious diseases were reported in Madagascar and Comoro Islands during July 1948 as follows:

Disease	July 1948			
	Aliens		Natives	
	Cases	Deaths	Cases	Deaths
Beri-beri	0	0	1	0
Bilharziasis	1	0	132	0
Cerebrospinal meningitis	2	0	20	7
Diphtheria	3	0	0	0
Dysentery:				
Amebic	12	0	233	4
Bacillary	2	0	36	0
Erysipelas	0	0	14	1
Influenza	67	6	12,271	184
Leprosy	0	0	32	1
Malaria	626	6	33,282	368
Measles	0	0	422	0
Mumps	3	0	115	0
Plague	0	0	1	1
Pneumonia, broncho	1	1	310	72
Pneumonia, pneumococcic	8	1	863	173
Puerperal infection	0	0	11	2
Scarlet fever	1	0	0	0
Tuberculosis, pulmonary	7	1	92	19
Typhoid fever	2	0	3	0
Whooping cough	0	0	129	1

NEW ZEALAND

Notifiable diseases—5 weeks ended July 31, 1948.—For the 5 weeks ended July 31, 1948, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	12	2	Poliomyelitis	126	3
Diphtheria	40		Puerperal fever	8	
Dysentery:			Scarlet fever	160	
Amebic	8		Tetanus	2	
Bacillary	12		Trachoma	3	
Erysipelas	22		Tuberculosis (all forms)	206	75
Influenza	2	2	Typhoid fever	2	
Malaria	1		Undulant fever	3	
Ophthalmia neonatorum	1				

STRAITS SETTLEMENTS

Singapore—Poliomyelitis.—For the week ended August 21, 1948, 6 cases of poliomyelitis with 2 deaths were reported in Singapore. The total reported for the period April 17–August 21 is 127 cases with 20 deaths.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Cholera

India—Madras Presidency.—For the week ended August 21, 1948, 1,170 cases of cholera with 478 deaths were reported in Madras Presidency, India. During the period August 22–September 4, 44 cases with 6 deaths were reported in Madras City.

India (French Settlements)—Pondicherry.—For the period August 8–21, 1948, 106 cases of cholera were reported in Pondicherry, French India.

Plague

Belgian Congo—Stanleyville Province.—On September 10, 1948, 1 fatal case of plague was reported at Mission Logo, northeast of Blukwa, in Stanleyville Province, Belgian Congo.

Indochina (French)—*Cochinchina.*—During the week ended September 4, 1948, 1 fatal case of plague was reported in Cape Saint James, Cochinchina, French Indochina.

Smallpox

Belgian Congo.—For the week ended August 14, 1948, 96 cases of smallpox (alastrim) were reported in Belgian Congo.

French West Africa—Dahomey.—During the period September 1–10, 1948, 42 cases of smallpox with 3 deaths were reported in Dahomey, French West Africa.

Gold Coast.—For the week ended August 28, 1948, 54 cases of smallpox with 11 deaths were reported in the Gold Coast.

Indochina (French)—*Annam State.*—For the week ended August 7, 1948, 35 cases of smallpox with 31 deaths were reported in Annam State, French Indochina.

Iraq.—For the week ended August 28, 1948, 35 cases of smallpox with 15 deaths were reported in Iraq.

Venezuela.—Smallpox (alastrim) has been reported in Venezuela as follows: For the week ended September 4, 1948, 25 cases in Santa Barbara, Barinas State; for the week ended September 11, 29 cases in Algarrobo Village, Sucre State.

Typhus Fever

Italy—Milan Province.—During the period August 1–20, 1948, 70 cases of typhus fever, murine type, were reported in Milan Province, Italy.

Yellow Fever

Brazil—Bahia State—Ilheus City (Itajuipe).—On May 12, 1948, 1 death from yellow fever was reported in Ilheus City, Itajuipe, Bahia State, Brazil.