

THE NECESSITY FOR MORE ACCURATE STATISTICS  
REGARDING THE DISTRIBUTION AND INCIDENCE  
OF TROPICAL DISEASES IN THE UNITED STATES<sup>1</sup>

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Thirty-six years ago, at the beginning of the Spanish American War, tropical diseases were practically unknown to American physicians but during the period of that war, and immediately following it, the pioneer work of Strong and Musgrave in the Philippines, of Ashford and his colleagues in Puerto Rico, and of other investigators working in laboratories in this country, forced upon the attention of American physicians the importance of tropical diseases not only as affecting the health of our troops in the Philippines, Guam, Cuba and Puerto Rico, but also their importance in this country. This pioneer work resulted in the recognition of tropical medicine in this country as a distinct branch of medical science and it was not long before it was established that many of the diseases thought to be tropical in their distribution also occurred in the United States, but had remained unrecognized by the profession, or their importance, from a public health standpoint, had not been appreciated. It is unnecessary at this time to call attention to the many fundamental discoveries in the etiology and epidemiology of tropical diseases which have been made since that period by American workers, as they are all familiar to this group, but it is important to recognize that our knowledge of the distribution and incidence of tropical diseases in the United States has not kept pace with the development of our knowledge in other directions.

That this is true is most forcibly brought to our attention by the publication of the excellent survey of diseases entitled "A

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Geography of Disease" prepared by our Secretary, Dr. McKinley, from data collected by an Advisory Committee of the Division of Medical Sciences of the National Research Council composed of Drs. Gay, Strong, and the late Theobald Smith, and published as a supplement to the AMERICAN JOURNAL OF TROPICAL MEDICINE in September, 1935. This publication demonstrates the lack of accurate data regarding the distribution and incidence of tropical diseases in the various states considered in the Survey and shows that the statistics that we have acquired regarding these phases of the subject during the past thirty-six years are insufficient, often inaccurate, and of very little real use in the evaluation of the importance of the infections considered as regards their geographical distribution and actual incidence. As stated in the foreword of the publication in question it is not offered as a complete summation of our knowledge regarding the geography of diseases but is a preliminary survey only, and it should be distinctly understood that what follows is not a criticism in any sense of the Survey itself, which is considered as a most valuable contribution, but is intended only to show how meager are our data as furnished by the reports of various State Health Departments and the necessity for greater care in the reporting of certain diseases by the practicing physician.

In considering the distribution and incidence of tropical diseases in the United States the Survey in question gives the data collected in the states selected by the Committee for this purpose. These states are Alabama, Arizona, California, Florida, Georgia, Kentucky, Louisiana, Mississippi, New Mexico, North Carolina, Oklahoma, Tennessee, Texas, Virginia and West Virginia and the data furnished in the Survey are from the last Board of Health Reports of the states in question, most of them covering the years 1932-1933, and in our consideration of the subject we have selected the data given in the Survey regarding the distribution and incidence of malaria, dengue fever, amebiasis and bacillary dysentery as reported in the states that have been mentioned.

#### MALARIA

The malarial fevers have been recognized as endemic in the United States, especially in some of the Southern States, from

the time that the medical history of this country has been written, and strenuous anti-malaria campaigns have been carried on by state and local authorities which have greatly diminished the morbidity and mortality of malaria throughout the country. While this is true, it is soon realized by one who desires to study the actual morbidity and mortality of malaria that it is impossible to secure data that actually show the real situation except, perhaps, in the case of the mortality of malaria in some regions, and even in these regions one must constantly bear in mind the fallacy introduced by inaccurate diagnoses based upon clinical symptoms instead of upon the demonstration of the malaria plasmodia in the blood of the patient. The data regarding the incidence of malaria in the states considered in this Survey forcibly illustrate the unsatisfactory nature of the information furnished by the official health reports of some of the states as regards the incidence of infections which, after thirty-six years of study, one would expect to be scientifically accurate and dependable.

In all of the states mentioned, with the exception of Arizona, California, Kentucky and West Virginia, malaria is considered in the health reports as an important public health problem, but in New Mexico and North Carolina no data are furnished regarding the incidence of these fevers, while in Oklahoma, in 1931, only 85 cases of malaria were reported in the report of the State Health Department and in North Carolina no figures regarding the incidence of malaria are given covering the period between 1931 and 1934. In those states giving the approximate number of cases of malaria it is noted that in Mississippi, in 1932, there were reported 36,133 cases of malaria, but in the neighboring states of Florida, Alabama and Louisiana the incidence of these fevers was very much less according to the State Board of Health reports. Thus, in Alabama only 2203 cases of malaria were reported in 1932; in Louisiana 3214 cases in 1933 and in Florida only 1111 cases in 1933. As regards the latter state there were 373 deaths reported from malaria during the same year, although only a little over 1000 cases were reported. This is the highest death rate for malaria that has ever been recorded and demonstrates beyond question how inaccurate were the data concerning the

incidence of malaria infections through that period of time in this state. It is also evident that the figures given for other states are about as inaccurate.

However, it is when one attempts to learn something about the distribution and relative incidence of the various types of malaria that the absence of reliable data becomes most evident. It is unnecessary here to stress the importance of knowing something about the incidence of benign tertian, sub-tertian and quartan malaria in malarial regions of this county, but despite all of the efforts that have been made during the past thirty-six years to make such data available the Survey demonstrates that little, if any, advance has been made in this respect. Thus, of the states considered in the Survey, only Alabama and Tennessee give us any information as to the relative incidence of benign tertian and sub-tertian malaria, the former reporting 553 cases of benign tertian and 175 cases of sub-tertian malaria in 1932, while the latter reported in the same year 325 cases of benign tertian and 153 cases of sub-tertian malaria. With these two exceptions we have no data regarding this most important epidemiological problem included in the health reports of the various states and it may be truly asserted that it is impossible today to prepare a map showing, with any degree of accuracy, the distribution of tertian, sub-tertian and quartan malaria in this country. This is certainly a reproach to American medicine and indicates the necessity of more accurate statistics regarding the subject.

#### DENGUE FEVER

The statistics furnished in the Survey regarding the distribution and incidence of dengue fever, in the various State Board of Health reports, are practically worthless. This disease, according to the data furnished the Survey, has never occurred and is not now present in any of the states considered except Georgia, Louisiana, Mississippi and Texas. Of course we all know that dengue fever has occurred in the past in practically all of the Southern States, although it may not have been present during the periods considered in the various State Board of Health reports from which the Survey was compiled. However, in the

states reporting dengue, the statistics given are almost laughable to one who has had any experience with this infection. Thus, in Georgia there are six cases of dengue fever reported during 1932; in Louisiana, 3 cases during 1933; in Mississippi, 47 cases during 1932, and in Texas, 18 cases during the year 1931-1932. There is probably no disease that spreads more rapidly, after the introduction of a case in a locality, than does dengue fever, and it is obviously impossible for any such small number of cases of dengue to be present in any locality, so that in every one of these instances there must have been a mistake in diagnosis except in the case of Mississippi, where it is possible that a very slight and limited epidemic occurred during the period mentioned. Such data as these are worse than useless in trying to ascertain the real incidence of a disease in any locality and again demonstrate the necessity for more accurate statistics regarding the distribution of tropical diseases in this country.

#### AMEBIASIS

The data regarding the distribution and incidence of amebiasis in the states considered in the Survey are exceedingly meager as would be expected when one remembers that infection with *Endamoeba histolytica* is still considered as rare in this country, and the symptom complex called "amebic dysentery" is still regarded by the great mass of the profession as prevalent only in the tropics or the warmer portions of the sub-tropics. In the reports of the various State Departments of Health it is evident that the term "amebiasis" is interpreted to mean "amebic dysentery" and this, in part, accounts for the limited amount of data shown in this Survey regarding the distribution and incidence of amebiasis. Until the medical profession learns that dysentery is only a part of the clinical picture of amebiasis can we hope or expect that our data regarding this infection will even approach accuracy.

In but one state, California, is it stated that amebiasis is considered an important public health problem, despite the fact that this infection is certainly much less prevalent in that State than some of the Southern States, although in the health reports of

many of these states it is not even mentioned as being present. According to the State Board of Health Reports of Alabama, Arizona, Kentucky, Louisiana, New Mexico, North Carolina, Oklahoma, Tennessee, Texas and West Virginia, covering the periods mentioned in the Survey, amebiasis is not present nor has it been present previously. In view of extensive surveys made by Faust in Louisiana; by Meloney, Meloney, Bishop and Leathers and Milam and Meloney in Tennessee it is indeed surprising that the state health reports did not mention in either of these states the occurrence of this infection. These surveys, as you know, showed an incidence of infection with *E. histolytica* varying from 10 to as high as 38 per cent in the various economic classes investigated, and while most of the infections were not accompanied by symptoms of amebic dysentery it is well known that in both Louisiana and Tennessee amebic dysentery is endemic in certain localities.

That the states reporting amebiasis have included in their data only cases of amebic dysentery is shown by the small number of cases that are reported. Thus, in California only 100 cases were reported during 1931; in Florida 9 cases were reported in 1932, all fatal; in Georgia only 3 cases were reported; and in Virginia 2 cases, both fatal. These small figures indicate that only cases of amebic dysentery were reported and that in most instances only fatal cases. The only state which is apparently "amebiasis-conscious" is Mississippi, for in 1932 the State Board of Health reports 481 cases of amebiasis. Whether these were all cases of amebic dysentery, or not, we have been unable to learn, but probably not. At any rate, the State Board of Health in Mississippi is apparently succeeding in obtaining much more accurate information regarding the incidence of amebiasis in that State than any other state considered in the Survey.

It is unnecessary to comment upon the inaccuracy and lack of value of the data furnished by the various State Board of Health reports regarding the distribution and incidence of amebiasis. As will be seen later in discussing the distribution and incidence of bacillary dysentery it is very evident that there exists a great deal of confusion in the minds of the profession regarding the

relative incidence of amebic and bacillary dysentery and it is believed that many cases of amebic dysentery have been considered to be of bacillary origin and so reported to the various State Boards of Health. It is very evident that at the present time it is impossible to secure from any of the State Board of Health reports, with the possible exception of Mississippi, any adequate data regarding the distribution and incidence of this infection. It is probable that the lack of data in some instances is due to the fact that amebiasis and amebic dysentery are not reportable diseases in some of the states, but if they are not they certainly should be, and there should be a distinction made between the various clinical types of amebiasis in such reports and the complications of amebiasis, as amebic abscess of the liver should be notifiable and should be reported, and carriers of *E. histolytica* should also be reported as such. Only by making these conditions reportable can we hope to arrive at any just conclusion regarding the real distribution and incidence of amebiasis in this country.

#### BACILLARY DYSENTERY

The dysenteries included in the bacillary group are stated to be important public health problems in California, Georgia, Kentucky, Louisiana, Mississippi, Oklahoma, Tennessee, Texas, and Virginia. From the data given in the Survey bacillary dysentery is apparently most prevalent in California, Georgia, Mississippi and Virginia. In California, in 1931, 193 cases were reported; in Georgia, in 1932, 435 cases; in Mississippi, in 1932, 5688 cases; while in Virginia in 1933, 270 cases were reported. In Kentucky bacillary dysentery is reported as "common" but no figures are given as to its incidence. While stated to be an important public health problem in Louisiana and Tennessee, only 79 cases were reported in Louisiana in 1933 and only 24 cases in Tennessee in 1932-33. North Carolina reported a single case of bacillary dysentery in 1933. In Virginia there occurred 5940 cases of dysentery and diarrhea as stated in the Survey, of which 270 were reported as bacillary dysentery and none as amebic, while in Mississippi there were reported 5688 cases of bacillary dysentery and 481 cases of amebiasis in 1932.

In considering these figures it is evident that they must be inaccurate and that as a whole they are of little assistance in endeavoring to ascertain the real distribution and incidence of bacillary dysentery in the Southern portion of this country. It is certainly safe to say that the vast majority of the diagnoses were not based on bacteriological findings but upon the clinical picture present, and it is well known that even the most experienced diagnosticians can not differentiate between many cases of bacillary and amebic dysentery from clinical symptoms alone, so that it is justifiable to assume that a certain proportion of cases reported as bacillary were actually amebic in causation.

While it is undoubtedly true that in the tropics and sub-tropics bacillary dysentery is frequently mistaken for amebic, it is believed that in our own country amebic dysentery is constantly being confused with bacillary dysentery and so diagnosed. The writer has frequently been consulted in cases in which this mistake in diagnosis had occurred and very recently has had brought to his attention a fatal case of amebic dysentery which was diagnosed and treated as bacillary dysentery until a few hours before death when the stool was examined for *E. histolytica* and found to be swarming with trophozoites of this parasite. In this case the diagnosis of bacillary dysentery was based entirely upon the symptoms present and it well illustrates the fallacy of relying upon the clinical picture alone in differentiating these types of dysentery. It is always difficult and frequently impossible to make a bacteriological diagnosis in bacillary dysentery, as is well known by everyone who has had experience in this line, but it is always easy to demonstrate *E. histolytica* in the stools of amebic dysentery patients, so that a routine stool examination for this parasite should be made in every case of dysentery, and until this is done one can not expect to obtain accurate figures as to the distribution and incidence of these two types of dysentery in any locality.

The data concerning the diseases considered in this Survey are representative of those submitted for many other diseases, and well illustrate of how little value such data are when one desires to investigate the actual distribution and incidence of tropical



diseases in this country. The various State Boards of Health are not to blame for the paucity and inaccuracy of the data presented in their reports, for the responsibility rests largely upon the shoulders of the practicing physicians who fail to report their cases or to use the most approved methods in the diagnosis of these diseases. For instance, it is evident that our statistics regarding the real incidence and distribution of malaria in this country will never be really valuable until the practitioner bases his diagnosis of these infections upon the demonstration of the malaria plasmodia in the blood of the patient. One would expect that after several generations of physicians had graduated from medical schools in which the microscopical diagnosis of malaria is consistently stressed as the only reliable diagnostic method, our statistics as to the distribution and incidence of the various types of malarial infection would be fairly reliable, but as already stated, it is impossible at the present time to prepare a map of the distribution of benign tertian, sub-tertian and quartan malaria in this country because of the lack of data upon the subject. Nothing could prove more positively that the use of the microscope in the diagnosis of these infections is still neglected, despite the excellent training that modern medical students receive in this respect. Even though the physician himself might be unacquainted with the technic of microscopical examinations for malaria, there is no excuse for the neglect of this procedure, for the various State Boards of Health maintain laboratories and facilities for this purpose and all that the physician has to do, if he is unable to use the microscope himself, is to send a specimen of blood to the local State Board of Health laboratory for such examinations. It would appear that one of the most difficult lessons for the medical profession to learn is that the diagnosis of the malarial infections is often impossible from a clinical standpoint alone, as the symptoms are simulated by so many other disease processes, and until this lesson is thoroughly learned we will continue to have hundreds of wrong diagnoses submitted to the public health authorities.

It is unnecessary to further stress the inaccuracy of the data which are available regarding the distribution and incidence of

tropical diseases in this country and, perhaps, not the least valuable of the results obtained by this Survey, is the demonstration of this fact. It should lead to renewed interest upon the part of the practicing physician and local and state Boards of Health in the reporting of such diseases and in the utilization of the most approved modern methods of diagnosis. It is believed that the Academy of Tropical Medicine and the American Society of Tropical Medicine can accomplish much good in this direction by calling attention to the unsatisfactory character of the data we possess regarding this subject and in urging the adoption of measures which will help to make our data more valuable.