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Accuracy of Supplemental Medical Information on Birth Certificates

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The past several years have witnessed an increased interest in the routine collection of morbidity statistics. The value of this procedure depends upon the accuracy of the reported data and extent of under-reporting. Although several types of morbidity reporting systems are in use, knowledge of the accuracy of information obtained is limited (*1*). The addition of a supplemental medical report on the birth certificate has provided a new type of morbidity reporting. This report is designed to obtain data on diseases and injuries occurring during pregnancy and parturition. The increasing use of this type of reporting makes it essential that its accuracy be studied.

As a result of inquiries into the causes of loss of life of mothers and infants in the 1930's, the need for basic medical information was stressed (*2*). Since this information could be continuously and currently obtained only from birth certificates, a supplemental medical report form on the face of the birth certificate was included as optional for the States on the model birth certificate prepared in 1939 by the Division of Vital Statistics of the U. S. Bureau of the Census. The form was adopted in New York State [1] in January 1940, but was placed on the reverse side of the certificate. The form now in use (fig. 1) requests information on complications of pregnancy and labor,[2] operative or instrumental procedures,[3] method of induction of labor, Rh factor, birth injuries, and congenital malformations.[4]

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[1] When New York State is mentioned in this study, it is understood that the area covered is New York State exclusive of New York City.

[2] Whether or not a complication is thought to be present depends upon the judgment of the physician or person completing the report. In obstetrics, however, the clinical entities are fairly well categorized. The types and groups of complications reported may be noted from table 3.

[3] The term, operative procedures, does not include episiotomies.

[4] Prior to January 1, 1949, the question on Rh factor was not included, but birth weight and the indications for operative procedure were requested. Beginning on January 1, 1949, the question on birth weight was transferred to the face of the certificate, that on the indications for operative procedures was omitted, and Rh factor added.

During the decade that this form has been used, information in the supplemental report has been given on about 90 percent of the birth certificates. Some of the statistical aspects of tabulating these data have been reported on the basis of the first 18 months' experience with this report form (*3*). From indirect evidence, it was thought that the complications were understated in varying degree, but no attempt was made to determine the actual degree of under-reporting.

The widespread adoption of this supplemental report and the desire to use this type of information in studies of reproductive wastage made it desirable to ascertain the accuracy of the information thus obtained. This presentation reports the results of such a study.

Method of Study

Since in New York State 97.5 percent of the births recorded in 1949 occurred in hospitals, the best method of determining the accuracy of reporting is a comparison of the hospital record with the birth certificate. Hospital records, although not always complete, provide a convenient method for this type of investigation. Therefore, any under-reporting found by such a comparison will be less than the true differences between the actual event and the report on the certificate.

A study of a random sample of all birth certificates was ruled out since it was impractical to visit all the hospitals that would be selected through such a procedure. Consideration was also given to the variations that were believed to exist among types of hospitals. It was first thought that hospitals connected with medical schools would have a higher degree of reporting than others. To take into account this possible variation, a sampling procedure stratified by type of hospital was selected at the start of the study. However, after the first six hospitals were investigated, the results did not warrant study of additional hospitals.

The total number of hospitals and births recorded in 1949 in New York State and the births in the six hospitals sampled are presented in table 1 according to size of hospital.

Table 1. ***Distribution of hospitals and live births in Upstate New York and in the sample, by size of hospital, 1949***

Size of hospital by number of births	Number of hospitals	Total births	Hospitals in sample	Total births in sample hospitals	Total births in sample
Over 1000	38	68,489	4	7,631	673
500–1000	61	42,524	1	825	208
Less than 500	158	30,911	1	437	219
Total	257	141,924	6	8,893	1,100
Home births		3,691			
Total live births		145,615			

The four sampled hospitals that had over 1,000 births in 1949 were connected with medical schools. Of the remaining two hospitals, one was a voluntary institution and the other proprietary. These six hospitals were well distributed over New York State.

For each hospital, a systematic random sample was obtained of approximately 200 births registered with the Office of Vital Statistics of the New York State Department of Health in 1949. A list of names of births was sent to the medical record librarian of the hospital. A team consisting of the consultant obstetrician of the Bureau of Maternal and Child Health and a biostatistician of the Office of Vital Statistics visited each hospital and compared the hospital record with the statements on the reverse of the birth certificate.

Hospital records were found for all cases selected except 21 which were not available at the time of inspection. In hospital A, however, only 92 of the 189 selected certificates had the supplemental report filled out. In this hospital, only half of the practicing physicians complete the supplemental report routinely. Only the completed certificates were included in the tabulations in this report since this study is based on a comparison of hospital records with the group of birth certificates (90 percent) that had been filled out.

Results

In all, 1,100 birth certificates with supplemental medical reports completed were compared with hospital records (table 2). The hospital records disclosed that complications of pregnancy or labor were present in 291 births. Information about these complications was found on only 113 or 39 percent of the birth certificates. The question on complications of pregnancy or labor was answered in the negative on the birth certificates in 178 cases in which such information appeared on the hospital record. It should be emphasized that the

Table 2. *The percentage of complications of pregnancy and parturition, operative procedures and birth injuries and malformations reported in each hospital sample*

Hospitals sampled	Births recorded in 1949	Number records examined	Complications of pregnancy and parturition			Operative procedures			Birth injuries and malformations		
			On hosp. records	On birth certifs.	Percent reported	On hosp. records	On birth certifs.	Percent reported	On hosp. records	On birth certifs.	Percent reported
Total	8,893	1,100	291	113	39	548	513	94	41	13	34
Hospital A	2,405	92	18	6	33	11	7	64	1	0	0
Hospital B	1,536	194	51	29	57	39	33	84	9	2	22
Hospital C	1,321	194	57	15	26	129	130	101	11	2	18
Hospital D	2,369	193	46	8	17	144	140	97	3	0	0
Hospital E	825	208	64	18	28	137	117	85	8	4	50
Hospital F	437	219	55	37	67	88	86	98	9	5	56

space was not left blank on the certificate; it was stated that no complication had occurred.

The 113 births with complications stated on the certificate were all reported correctly, that is, the particular complication mentioned on the birth certificate was also on the hospital record. In this sample, at least, it may be concluded that all the complications reported on the birth certificate were actually present, but that less than half of the actual complications mentioned in the hospital records were reported on the birth certificate.

The percentage of complications reported in each of the six hospitals varied from 17 percent in hospital D to 67 percent in hospital F. This variation was thought to be related to the differences in practice among these hospitals with regard to the person completing the birth certificate. In hospitals A, B, C, and E, the certificate was completed by the supervising nurse. In hospital D, the resident physician or interne had this responsibility and in hospital F, the practicing physician. One of the reasons for the marked degree of underreporting may be that hospital personnel, either physician or nurse, complete the certificate in five of these hospitals. Even though the complete hospital record is available, these individuals are naturally not as cognizant of complications that had occurred during the prenatal period. They are, no doubt, more aware of complications at or near the time of labor. This is borne out by table 3 which presents the degree of reporting by either individual complications or groups of complications.

The percentage of types of complications reported varies from 9

Table 3. ***The distribution of complications of pregnancy and parturition reported in hospital sample, and in New York State (exclusive of New York City) during 1949***

	Total live births 1949	Hospital sample of 1,100		
		On hospital record	On birth certificate	Percent reported
Total	145,615			
Question on complication not answered	14,577			
Total with question answered	131,038			
No complications of pregnancy or labor	111,552	809	987	
With complications of pregnancy or labor	19,486	291	113	
Total complications	21,192	309	114	37
Deviations of the bony pelvis	1,352	10	5	50
Breech presentation	3,200	41	26	63
Other dystocia	8,275	100	42	42
Cord anomalies	388	5	2	40
Previous pelvic trauma	1,111	7	7	100
Postpartum hemorrhage	382	10	2	20
Toxemias	2,122	36	9	25
Placental anomalies	1,631	16	12	75
Bleeding during pregnancy or labor	594	38	4	11
Other puerperal complications [1]	514	2	1	50
Nonpuerperal complications [2]	1,623	44	4	9

[1] Other puerperal complications include pyelitis, other genito-urinary diseases, and hydramnios.
[2] Nonpuerperal complications include heart disease, tuberculosis, syphilis, endocrine diseases, anemia and blood diseases, appendicitis, respiratory diseases, other intercurrent diseases.

to 100 percent. The lowest percentage is for nonpuerperal complications which include tuberculosis, syphilis, heart disease, diabetes, etc. These complications are usually diagnosed during the prenatal period, and hospital personnel may not know about them since they have, in most instances, been already controlled by the physician by the time the patient is admitted for delivery. On the other hand, 75 percent of placental anomalies and 63 percent of breech deliveries are reported. These are primarily complications that are diagnosed at or near the time of delivery. The complete reporting (100 percent) of previous pelvic trauma was the result of the mention of a previous Cesarean section on both the hospital record and certificate as an indication for another Cesarean. The low percentage of reports of postpartum hemorrhage is expected since the birth certificate is usually completed soon after the birth before the occurrence of the hemorrhage.

Table 3 also includes the distribution of complications of pregnancy and parturition that occurred among all live births recorded in New York State in 1949. The distribution of complications in the hospital sample does not differ significantly from this distribution.

It is desirable to know the conditions under which the degree of under-reporting would be minimal. This point was investigated in the cases of neonatal deaths and Caesarean sections. In the sample of 1,100 births, 19 infants died within the first month of life. In 12 of these, the mother had a complication recorded on the hospital chart, 11 of which were reported on the certificate. This study is concerned solely with birth certificates of live births and does not include stillbirths. As in the case of neonatal deaths, the degree of under-reporting of complications associated with stillbirths is probably also low. This is to be expected since the individual completing the certificate is more conscious of the possible causes of stillbirths or neonatal deaths.

In this sample there were 34 Caesarean sections. Complications were mentioned in 33 of these on the hospital record, and 25, or 76 percent, of these complications were reported on the birth certificate. This relatively higher degree of reporting is probably related to the dramatic operative procedure involved.

The reporting of operative or instrumental procedures was found to be at a much higher level; 94 percent of all procedures recorded on hospital charts were reported on the certificate (table 2). However, there were five errors in reporting. Two of these consisted of reporting low forceps procedures on the certificate when none was stated on the hospital record. The other three consisted of interchanges of low and mid forceps procedures. In general, reporting of the operative and instrumental procedures appears to be satisfactory.

The reporting of birth injuries and congenital malformations in the

sample is approximately on the same level as the reporting of complications (table 2). The numbers are too small to permit drawing any conclusions other than that considerable under-reporting exists. This may be due to the fact that many malformations and birth injuries are diagnosed after the certificate is completed.

Discussion

A distressing degree of under-reporting of complications of pregnancy and labor on the birth certificate is disclosed by the present study. Originally, the medical report was added in order to provide a means for studying the factors involved in the causation of maternal and neonatal mortality, prematurity, etc. Such information could be continuously and currently obtained only through birth and stillbirth certificates. The use of this information in program planning has been indicated by earlier workers (*4*, *5*). The need for collection of such data is as important today as when the present system was inaugurated. Recent studies have indicated a method by which this information might be utilized administratively in the evaluation of programs for the care of the premature infant (*6*) and as an aid in early case finding of cerebral palsy (*7*). Thus, the collection of accurate data is important both from the viewpoint of epidemiological research and from the administrative viewpoint of program planning, case finding, etc., in the field of maternal and child health. The mere fact that about 40 States have placed the supplementary medical items on their birth certificates in one form or another, indicates the prevailing view that such information is of value.

The basic problem which must be faced is that of finding methods by which the accuracy of reporting can be increased. Since this

Supplemental Medical Report—Not To Be Copied Into Local Register

All facts entered below will be considered confidential and will not appear in the certifications or transcripts issued by the Department

State any complications of pregnancy and labor

State any operative or instrumental procedures used

Was labor induced?	If yes, state whether	Was mother's blood tested for Rh factor?	If yes, was blood
Yes ☐ No ☐	Mechanically ☐ Other means ☐	Yes ☐ No ☐	Rh+☐ Rh−☐

Describe any birth injury

Describe any congenital malformation

Figure 1. Supplemental medical report on reverse of live birth certificate in use during 1949 in New York State.

system was inaugurated, no consistent attempt has been made to show physicians the value of accurate and complete reporting of this type of data. A start has been made to promote better reporting in New York State through the support of the Medical Society of the State of New York (*8*). The other means by which the accuracy of reporting may be increased is indicated in some of the findings of the present study, namely, that in four of the six hospitals the report is completed by the supervising nurse. There might be further improvement if the physician who has had the case under his supervision during the prenatal period would complete the forms.

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Complications of Pregnancy and Labor. (*Check at least one item in each column.*)

Related to Pregnancy	Not Related to Pregnancy	Labor	Operative Procedures
☐ None ☐ Pre-eclampsia ☐ Eclampsia ☐ Hypertensive disease ☐ Nephritis ☐ Pernicious vomiting ☐ Pyelitis ☐ Anemia ☐ Other—specify	☐ None ☐ Heart disease ☐ Diabetes ☐ Syphilis ☐ Tuberculosis ☐ Other—specify	☐ None ☐ Placenta previa ☐ Premature separation of placenta ☐ Prolapse of cord ☐ Anomaly of cord ☐ Breech presentation ☐ Other malpresentations ☐ Contracted pelvis ☐ Other dystocia ☐ Postpartum hemorrhage ☐ Other—specify	☐ None ☐ Low forceps ☐ Mid forceps ☐ High forceps ☐ Cesarean section ☐ Breech extraction ☐ Internal version & extraction ☐ Other—specify

Was mother's blood tested for Rh factor?
No ☐ Yes, Rh+ ☐ Yes, Rh− ☐

Birth injury to infant: No ☐ Yes ☐ If yes, describe

Congenital malformation of infant: No ☐ Yes ☐ If yes— describe

Figure 2. Revised supplemental medical report in experimental use in several hospitals in New York State.

The present form (fig. 1) also leaves some doubt in the mind of the person completing it as to the information sought. The greater degree of reporting of operative procedures may be due to the fact that an operative procedure is a specific entity while a complication of pregnancy is more or less a matter of judgment. To overcome this difficulty, a new form has been devised (fig. 2) in which specific complications and operative procedures are listed and the physician need only check the appropriate item, thereby greatly facilitating the completion of the certificate. The revised form has been endorsed for experimental use by the Medical Society of the State of New York and is being tried in several hospitals. A report concerning the efficiency of this form will be presented when sufficient data have been obtained.

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Summary and Conclusions

A sample of births that occurred in six hospitals in New York State was studied in an attempt to determine the degree of accuracy of reporting complications of pregnancy and parturition, operative procedures, and birth injuries and malformations. The hospital records of 1,100 births were compared with the information reported on the birth certificate.

It was found that 39 percent of the complications of pregnancy and parturition, 94 percent of operative procedures, and 34 percent of birth injuries and malformations recorded on the hospital charts were also reported on the birth certificates. All the complications mentioned on the certificate were reported correctly. In the event of a neonatal death or a Caesarean section, the degree of reporting was markedly increased; 92 percent of the complications in neonatal deaths and 75 percent of the complications associated with Caesarean sections were reported. In addition, when types of complications were considered, those occurring during labor and delivery were more adequately reported than those occurring during the prenatal period. This was correlated with the fact that in four of the six hospitals the certificates were completed by hospital personnel.

The necessity for obtaining complete and accurate maternal morbidity data was emphasized. Methods of improving accuracy of reporting were discussed with emphasis on a revised supplemental report form to facilitate completion of the report.

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Q Fever Studies in Southern California

XII. Aureomycin Treatment of Dairy Cattle Naturally Infected With *Coxiella burnetii*

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Cattle have been repeatedly implicated by epidemiological studies as sources of Q fever infection for man (*1, 2, 3, 4, 5*). *Coxiella burnetii*, the causative agent, has been found in the milk of more than 10 percent of dairy cows studied in the Los Angeles area (*6*). Intensive epidemiological studies in the area have shown that dairy cattle and their products, such as raw milk, are an important source of human infection (*4, 5*).

Epizoologic studies showed that, of 60,000 dairy cattle shipped into the area annually, between 40 to 50 percent acquire asymptomatic infection within 6 months after being brought onto infected premises (*7*). These animals shed *C. burnetii* continuously or intermittently in the milk for periods of time exceeding one lactation period (*8*). The organisms were isolated on autopsy from the mammary gland and adjacent lymph nodes of an infected cow (*9*). Recently, dairy cows have been shown to be sources of gross contamination to the environment by the postparturient passage of highly infected placental membranes (*10*).

Ultimate control of human Q fever may be dependent on the control or eradication of the infectious agent in livestock. This control might be accomplished through therapy of infected animals or by prophylactic methods. Aureomycin, an antibiotic, has been found effective in modifying *C. burnetii* infections in experimental animals and man (*11, 12*). We are reporting on a pilot study of the effect of aureomycin treatment of dairy cows naturally infected with *C. burnetii*.

Material and Methods

The effectiveness of aureomycin [1] in overcoming bovine infection with *C. burnetii* was determined by the presence of the organisms in

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[1] Aureomycin-Lederle. The workers are indebted to Dr. Herald Cox, Chief of the Virus and Rickettsial Laboratory, Lederle Laboratories, Division of American Cyanamid Co., Pearl River, N. Y., for supplying the drug used in this study.

the milk of dairy cows before and following treatment, and by the presence of specific complement-fixing antibodies in the blood serum of such cows. Two methods of treatment, intramammary infusion and intravenous injection, were studied in separate experiments on infected dairy cows of two commercial dairy herds.

Methods of Determining Infection

The infection status of the cows was determined a month before, during, and after treatment by means of the complement-fixation test of the blood serums (*13*). Mature lactating cows having antibody titers of 3+ at 1:32 or greater were selected, since 90 to 95 percent of such animals have been found to be shedding organisms in their milk (*7*). Cows were selected with factors of age, breed, and lactation equalized between 10 test and 10 control cows in each of the two herds studied. The influence of udder indurations and clinical evidence of mastitis upon the effectiveness of the drug was considered.

The infection status of the selected cows was further determined by the presence of *C. burnetii* in their milk as demonstrated by the guinea-pig test. Specimens from each of the four quarters of the udders of all cows were collected prior to, during, and at intervals after treatment. These were frozen at −10° C. and kept until injected subcutaneously in amounts of 1 cc. and intraperitoneally in amounts of 3 cc. in two 500–800 gm. guinea pigs. Uninoculated control guinea pigs were distributed among the test guinea pigs to determine the prevalence of spontaneous infection among the test animals. Guinea pigs were bled from the heart 30 days later, and the serums were tested for complement-fixing antibodies against *C. burnetii* (*13*). A titer of 3+ at 1:32 or greater in serums of one or both guinea pigs was regarded as evidence of infection and of the presence of *C. burnetii* in the milk specimen being tested.

Tests were performed on the milk specimens from each udder quarter of all cows before starting treatment. Milk specimens from cows treated by udder infusion were tested 4 and 11 days following completion of treatment. Specimens of cows treated intravenously were tested 3 days, 14 days, and 6 months following treatment. Corresponding milk specimens from control cows were not all tested in guinea pigs.

Methods of Treatment

Udder Infusion Study. A dosage of between 50–400 mgm. of aureomycin per quarter per day for intramammary infusion was indicated by earlier work (*14, 15*). Each quarter of the udder of the treated cows was infused twice a day for 5 days with 100 mgm. of aureomycin HCl in 50 cc. volumes of sterile distilled water. During the course of

treatment each quarter received 1 gm. of the drug, or a total of 4 gm. per cow. Sterile bovine intravenous outfits and teat cannulas were used in administering the drug solution. After infusion the udder was gently massaged in an attempt to facilitate dispersion of the solution. Leukocyte counts (Breed method) were performed on quarter milk specimens taken before and during therapy.

Intravenous Injection Study. Five to 10 mgm. per kgm. of body weight was believed to represent a safe dosage (*14, 15*). The average weight of the cows was estimated at 500 kgm. Each treated cow received an initial dose of 5 gm. (10 mgm./kgm.) followed by four daily doses of 2.5 gm. (5 mgm./kgm.) in 500 cc. of sterile pyrogen-free distilled water. Each cow received a total of 15 gm. of aureomycin HCl during the 5-day course of treatment. Injection was made into the jugular vein with a gravity flow bovine intravenous outfit.

Results

Systemic reaction to the drug was absent during and after treatment except in two cows that showed anorexia for several days during intravenous treatment, a reaction possibly due to the medication. Milk production, except for the same two animals, remained within normal limits. One animal showed a temporary discomfort due to perivascular seepage during intravenous injection. No clinical mammary gland reaction to infusion of the drug was noted.

No significant changes were observed in serum antibody levels of test or control cows in either study group during or for a 9- to 11-month observation period following treatment.

It was concluded during the guinea pig testing of milk specimens that the occurrence of spontaneous infections was not high enough to interfere with interpretation of the guinea pig test results. Of 490 guinea pigs inoculated with milk specimens, 332, or 67.7 percent, produced Q fever antibodies, while, of 119 control uninoculated guinea pigs, 3, or 2.5 percent, showed the presence of antibody.

Udder Infusion Study. Prior to treatment, *C. burnetii* was present in the milk of all 10 treated cows (33 quarters) and in 9 control cows (24 quarters). Tests of the milk specimens taken on the 3d and 11th days after treatment indicated that not a single cow ceased shedding organisms in the milk during the 11-day period of observation. One cow ceased shedding organisms temporarily but was shedding on the 11th day (see table). Milk of control (untreated) cows tested as composite specimens at the 11th day showed that all 9 cows were still shedding *C. burnetii* in the milk.

Intravenous Study. Prior to treatment, *C. burnetii* was found in the milk of all 10 treated cows (26 quarters) and 10 control cows (24 quarters). Three days following completion of treatment 9 of 10 treated cows were found to be shedding organisms. Four of five cows

tested at 14 days were also found to be shedding *C. burnetii* from one or more quarters. Five of seven cows tested 6 months later were still shedding *C. burnetii* (see table). In summary, one cow ceased shedding (3 quarters) at 3 days and remained so at 14 days, and 6 months after treatment. Another cow ceased shedding (3 quarters) between the 14th-day and 6th-month (nonlactating) tests. It was not deemed necessary to test corresponding milk specimens in control cows.

Results of guinea pig test of cows milk before and after treatment with aureomycin

Type of treatment	Milk of cows positive [1] for *Coxiella burnetii*			
	Pretreatment	Post-treatment		
		3–4 days	11–14 days	6 months
Udder treatment	10/10	6/7	9/9	
Controls	9/10		9/10	
Intravenous treatment	10/10	9/10	4/5	5/7
Controls	10/10			

[1] One or more udder quarters infected as indicated by the guinea pig test.
Numerator—Cows positive.
Denominator—Cows tested.
Blank—Not tested.

Discussion

At the time these studies were initiated, one concept ascribed bovine Q fever as an asymptomatic infection localized in the mammary gland with a resultant contamination of the milk. The use of aurcomycin was considered a possible means of controlling milk contamination as a source of human infection. The drug was made available for these experimental studies before bovine dosage levels or methods of administration were fully established. The possibility exists that inadequate dosages may have been used.

Intramammary infusion of the 100 mgm. of aureomycin in saline solution twice a day for 5 days failed to overcome the infection. Only 2 of the 33 quarters were cleared of organisms following treatment, one of which resumed shedding within a few days. The other quarter was not retested. The milk of not a single cow was completely cleared of organisms during the period of observation.

Leukocyte counts on individual quarters before and during the intramammary infusion study did not reveal any significant difference between the cell counts of quarters infected with *C. burnetii* and those not infected. White cell counts during treatment were higher, but clinical signs of drug irritation of the udder were lacking.

The presence of organisms in the milk may be the result of a localization of infection within the udder. The recent isolation of *C. burnetii*

in large amounts from parturient placentas of infected dairy cows suggests a multiple localization of infection within the cow. With the occurrence of multiple *C. burnetii* localization, overcoming such infections through larger intramammary doses of the drug becomes open to question.

The failure of the intravenous treatment to rid the milk of infected cows of *C. burnetii*, or to alter the blood titers over a long period of observation, indicates that aureomycin in the amounts and frequency of administration used did not overcome infection in the cows. Although 9 (9/26) infected quarters appeared negative 3 days following treatment, subsequent tests at 14 days indicated that this represented, at best, only a temporary clearing in 5 of the 9 cleared quarters. Little significance can be attributed to the fact that one cow ceased shedding from all quarters 3 days following treatment or that one ceased shedding during her "dry" period 6 months later. Spontaneous cessation as well as intermittency of shedding organisms in the milk have been previously noted. Both cows were serologically positive with equally high titers 11 months after treatment, and the placenta obtained from one of the cows 15 months following treatment was found to contain *C. burnetii*.

In considering a practical method of control of bovine Q fever, certain factors, such as the large number of infected cows, constant new infections, the difficulty of administration, and economics, serve to militate against controlling the bovine disease by therapeutic means.

Summary

1. Thirty-nine of 40 (97.5 percent) dairy cows selected for the two treatment studies on the basis of high serum antibody levels were found to be shedding *C. burnetii* in their milk.

2. With the dosages of aureomycin used, no apparent decrease in antibodies occurred during or for a 9–11 month observation period following either intramammary or intravenous treatment.

3. Aureomycin administered by intramammary infusion (100 mgm. twice a day) for 5 days did not result in the clearing of *C. burnetii* from the milk of any of 10 treated cows during an 11-day observation period.

4. The treatment of cows by daily intravenous injection of a total of 15 gm. of aureomycin over a 5-day period failed to eliminate *C. burnetii* from the milk of 9 of 10 infected animals within 3 days, or from 5 of 7 cows tested 6 months later.

5. In light of present knowledge, certain practical limitations serve to minimize the possibility of a therapeutic control of Q fever in dairy cattle.

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Survey of Brucellosis in Slaughtered Hogs

By Norman B. McCullough, Ph.D., M.D.*† C. Wesley Eisele, M.D.*, and Emma Pavelchek*

In a preliminary paper, the isolation of *Brucella abortus* from naturally infected hogs was reported for the first time (*1*). The recovery of *Brucella melitensis* from hogs slaughtered in a Chicago packing plant was likewise reported.

Brucellosis in swine is recognized as a disease of increasing importance in the United States. Knowledge of the extent of this disease has rested primarily upon clinical observations in hogs and limited surveys employing the agglutination test.

The present investigation was undertaken in an attempt to extend our knowledge of the species of *Brucella* infecting swine, the extent of infection, and the amount of exposure of packing-plant personnel to *Brucella*.

Procedure

Submaxillary lymph nodes were obtained from hogs slaughtered in one of the large packing plants in Chicago. Samples were obtained each week for a period of 6 months. The lymph nodes were removed from the carcass immediately after the initial Bureau of Animal Industry inspection of head glands. Each specimen was removed with sterile instruments and placed in an individual sterile screw-capped glass jar. Upon return to the laboratory, the samples were promptly cultured. Each node was trimmed of fat and excess tissue, seared in a flame, sectioned, and the cut surface serrated and streaked directly on the surface of trypticase-soy agar medium. Sterile instruments were used throughout. The inoculated plates were incubated at 37° C. in an atmosphere of 10 percent added CO_2.

In cultures heavily overgrown with other organisms, *Brucella* cannot be detected. Hence, all plates showing an overgrowth were discarded and not included in the series. During the entire investigation, 152 plates were discarded for this reason. Plates streaked with nodes from which *Brucella* was not recovered have in most instances remained sterile or contained only scattered colonies of ubiquitous bacteria. Plates yielding *Brucella* have uniformly contained numerous colonies of the organism.

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Upon isolation of *Brucella*, cultures were identified by the usual methods, and the species was established by determination of CO_2 requirement, H_2S production, growth on differential dye plates, and the use of specific absorbed typing sera. Each strain was inoculated into guinea pigs. Four weeks later the blood was tested for the presence of agglutinins; the guinea pigs were sacrificed and cultures were made of the tissues.

Due to the difficulty in keeping track of a carcass in a large plant, no attempt was made to obtain blood samples from the particular hogs cultured. During the latter part of the study, blood samples were obtained at random from 1,008 hogs over a period of several weeks. The standard test tube agglutination test was performed on each sample with incubation at 37° C. for 48 hours. The antigen used was that regularly employed in our laboratory (*2*).

Results

Table 1 presents the results of the culture of submaxillary lymph nodes of 5,000 hogs obtained at weekly sampling over a period of 6 months. *Brucella* was isolated in 35 instances, or in 0.7 percent of the samples. Ten of the isolates were *Br. abortus*, 11 *Br. melitensis*, and 14 *Br. suis*. These strains, when subjected to the specific typing methods previously described, gave the reactions characteristic of the respective species.

Br. abortus was recovered on six different occasions well scattered over the period of the investigation. Similarly, *Br. melitensis* was repeatedly isolated, samples obtained on five different weeks yielding this species. *Br. suis* was isolated on seven occasions. One or more species of *Brucella* were isolated on 12 of the 26 weekly samplings.

All 35 of these strains of *Brucella* obtained from hogs were pathogenic for the guinea pig, agglutinins being produced and the organism being recovered from tissue cultures made at autopsy in all instances.

Table 2 presents the results of agglutination tests performed on samples of blood obtained at random from 1,008 hogs. Agglutinins were present in titers of 1/20 or higher in 40.28 percent of the sera, and in titers of 1/160 or higher in 6.45 percent.

Discussion

The agglutination test as presently applied to the diagnosis of brucellosis in swine has been considered far from satisfactory. It is said that frequently hogs having this disease fail to show agglutinins. The concept has arisen that no individual hog can be considered free from the disease unless the entire herd has negative tests (*3*). Using an antigen which we have found suitable for consistently detecting agglutinins in humans and which has been well standardized against

Table 1. *Isolation of* Brucella *from submaxillary lymph nodes of hogs*

Date	Number hogs examined	Number isolations of *Brucella*			
		Br. abortus	*Br. melitensis*	*Br. suis*	Total
Nov. 2, 1948	85	0	0	0	0
Nov. 9, 1948	117	0	0	0	0
Nov. 16, 1948	198	1	0	0	1
Nov. 23, 1948	196	0	0	0	0
Nov. 30, 1948	192	2	0	0	2
Dec. 7, 1948	196	0	2	0	2
Dec. 14, 1948	188	1	0	2	3
Dec. 21, 1948	198	0	0	0	0
Dec. 28, 1948	204	0	0	0	0
Jan. 4, 1949	200	0	0	0	0
Jan. 11, 1949	197	0	0	0	0
Jan. 18, 1949	205	4	0	0	4
Jan. 25, 1949	206	0	0	0	0
Feb. 1, 1949	215	0	0	0	0
Feb. 8, 1949	205	0	0	0	0
Feb. 15, 1949	205	0	0	0	0
Feb. 21, 1949	220	0	5	1	6
Mar. 1, 1949	207	0	0	1	1
Mar. 8, 1949	205	0	0	1	1
Mar. 15, 1949	211	0	0	0	0
Mar. 22, 1949	212	0	0	2	2
Mar. 29, 1949	212	0	0	0	0
Apr. 5, 1949	200	1	1	5	7
Apr. 12, 1949	210	1	2	0	3
Apr. 19, 1949	202	0	1	2	3
Apr. 27, 1949	114	0	0	0	0
Total	5,000	10	11	14	35

Table 2. *Results of the* Brucella *agglutination test performed on random samples of sera from slaughtered hogs*

Number tested	*Brucella* agglutination titer											
	Negative		1/20		1/40		1/80		1/160		1/320 or higher	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1,008	602	59.72	50	4.96	167	15.67	124	12.30	34	3.37	31	3.08

a battery of sera from culturally proved cases, surprisingly high incidences of positive tests and of high titers were obtained in this study.

The recovery of *Brucella* from the submaxillary lymph nodes of 35 out of 5,000 hogs (0.7 percent) should in no wise be interpreted as representing the total incidence of infection in these animals. It may, in fact, represent only those most heavily infected. When one considers the chance of recovering cultures from a single node of an infected animal, it is surprising that an incidence as high as this was found.

The regular recovery of all three species of *Brucella* in this study is noteworthy. Although *Br. abortus* in the hog had not heretofore been described, its occurrence was to be anticipated. We have observed human brucellosis due to *Br. abortus* occurring in packing-house workers where the exposure history implicated the hog as the source.

Br. melitensis had been reported from swine in the United States on two occasions only prior to the preliminary report of these investigations (*4*, *5*). Human epidemiological studies have now strongly implicated the hog as a source of this disease in man (*6*, *7*, *8*, *9*). Recently we have recovered *Br. melitensis* from a case of acute human brucellosis occurring in a meat inspector who worked in a Chicago packing plant. Twenty-seven days prior to hospitalization he had sustained a cut on the hand while inspecting the head glands of hogs. The cut later festered. According to the history obtained at the time of admission, fever first appeared about a week after the injury.

The lymph nodes which were cultured are those ordinarily thoroughly sectioned in the first step of the Bureau of Animal Industry inspection. Recovery of *Brucella*, at times as confluent growth, on plates streaked with these nodes implies that workers subsequently handling this area come into contact with high concentrations of *Brucella* organisms. This consideration, of course, does not imply that the head glands comprise the chief source of exposure of packing-house workers.

When one considers the incidence of high agglutinin titers found in this study, the question of exposure of packing-plant personnel to *Brucella* through the handling of hog carcasses assumes real importance. Even if the incidence of 0.7 percent culturally proved *Brucella* infection in hogs were assumed to provide the only exposure, personnel in large packing plants who routinely handle hog carcasses would come in contact with *Brucella* several times daily at least.

The repeated isolation of *Br. melitensis* emphasizes the growing public health importance of this infection in hogs.

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Plague in the Territory of Hawaii

I. Present Status of Plague Infection, Island of Hawaii

By Bertram Gross, M. S., and David D. Bonnet, Ph.D.*

At the present time, plague infection in the Territory of Hawaii is found in two relatively small areas; one within the Hamakua District on the Island of Hawaii (fig. 1) and one within the Makawao District on the Island of Maui. The possibility of plague spreading from these known foci to other areas on the same island or to other islands in the Hawaiian group is a constant threat and a matter of concern to both Territorial and Federal health agencies.

The primary goal of the plague surveillance and suppressive programs on the Islands of Hawaii and Maui is to provide the people of those areas and the people of the Territory with the maximum protection against plague infection that is practicable. Therefore, it is necessary that the programs be examined and evaluated periodically to determine if the desired goals are being attained.

As described by Eskey [1] plague was first reported in the Hawaiian Islands at the port of Honolulu, Island of Oahu, in December 1899. The infection spread to the Islands of Maui, Kaui, and Hawaii within a short time, with the first human case being reported on the Island of Hawaii at the port of Hilo in February 1900. Human cases were later reported on this island from the plantation villages of Olaa located 8 miles southwest of Hilo, and Papaikou, Pepeekeo and Laupahoehoe located 5, 12, and 25 miles, respectively, north of Hilo. A total of 43 human cases were reported from these areas (table 1).

The number of plague infections which were detected in rodents in the South Hilo and Puna Districts from 1900 to 1906 is not known. Since no plague laboratory existed during this period, it is probable that the effort to determine plague in rodents was limited. In 1907 however, a plague laboratory was established at Hilo under the supervision of the United States Public Health and Marine Hospital Service with funds supplied by the Territorial Board of Health. This was the first concentrated effort to detect and prove plague infection in rodents on the Island of Hawaii. As indicated in table 2, 137 rodent infections were found within the area extending from Olaa to Laupahoehoe.

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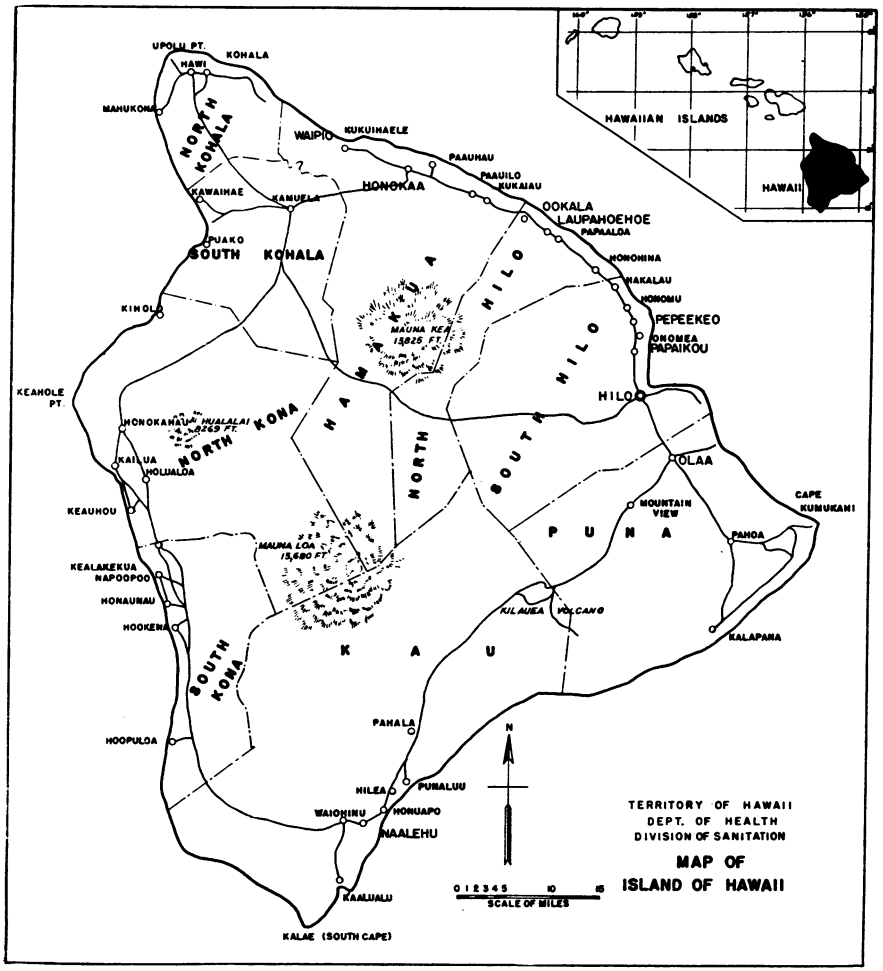


Figure 1.

Table 1. *Human plague cases in the Olaa–Laupahoehoe area* [1], *February 1900–May 1918*

District	Village	Cases	First case reported	Last case reported
South Hilo	Hilo	25	February 1900	March 1910.
	Papaikou	2	August 1909	September 1909.
	Pepeekeo	2	September 1909	September 1912.
Puna	Olaa	12	June 1905	September 1909.
North Hilo	Laupahoehoe	2	March 1918	May 1918.

[1] Two off-shipping cases reported from Naalehu, District of Kau, in 1906.

Although plague in humans and rodents disappeared spontaneously from Hilo and vicinity, as noted by Eskey, and has not been detected in the Olaa-Laupahoehoe sector since 1918, this area has been under continuous surveillance. This is necessary because of the importance

Table 2. *Plague detected in rodents in the Olaa-Laupahoehoe area, August 1907–May 1918*

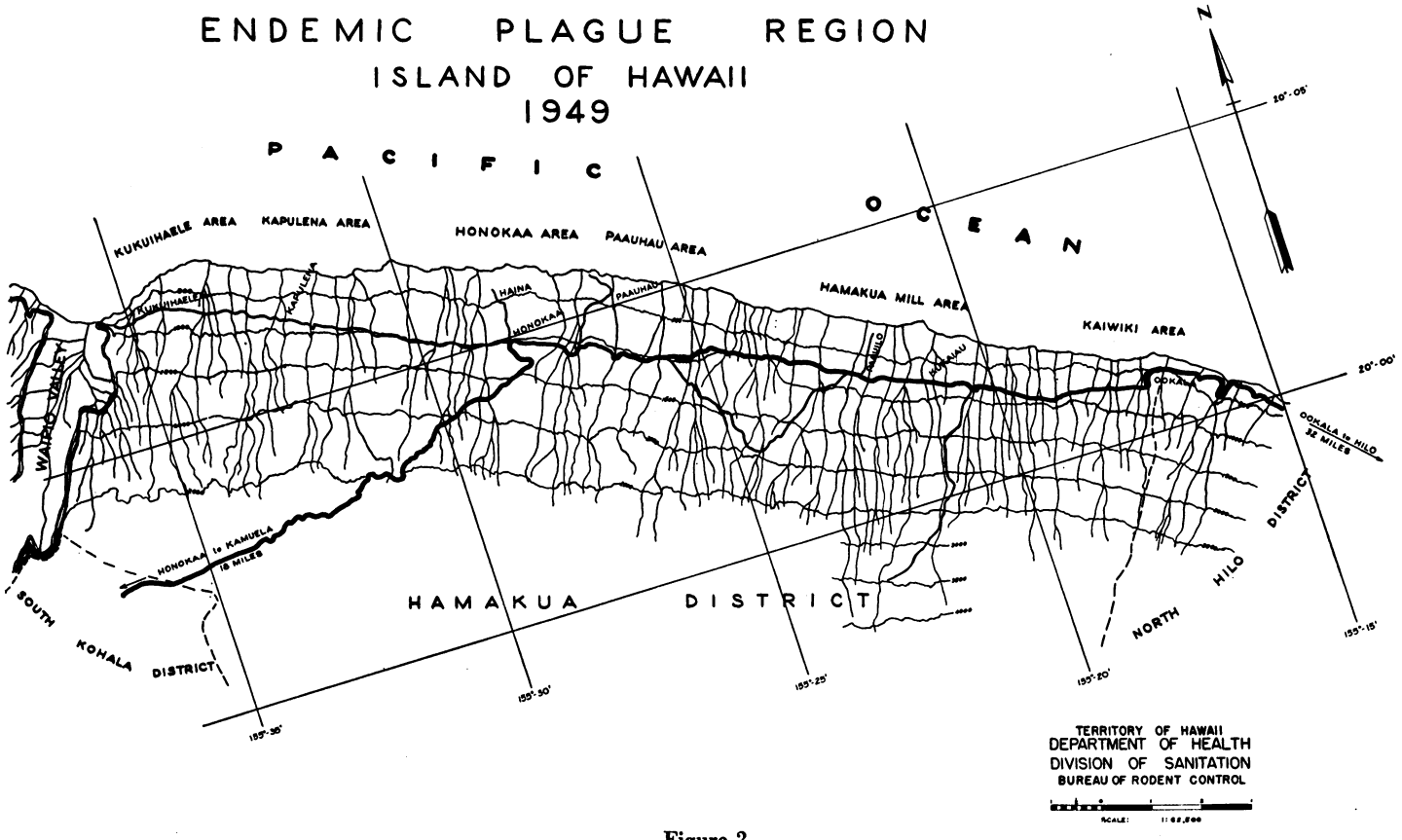
District	Village	Number infections	Period
Puna	Olaa	26	August 1907–September 1912.
South Hilo	Hilo City	94	October 1907–February 1912.
	Papaikou	4	August 1909–September 1909.
	Pepeekeo	4	October 1909–January 1910.
	Honomu	1	October 1909.
	Piihonua	2	April 1910.
	Hakalau (south side)	1	January 1913.
	Waiakea	1	February 1913.
North Hilo	Hakalau	3	September 1909–February 1912.
	Laupahoehoe	1	May 1918.

of Hilo as a shipping center and the former existence of plague infection in the area, and because of the spread of the disease in a northwesterly direction to the adjacent Hamakua District where it has continued to smolder since 1910.

To determine if plague infection in rodents is present in the Olaa-Laupahoehoe sector, a plague surveillance program has been maintained continually by the Territorial Department of Health. Snap traps are operated progressively throughout the City of Hilo, and particular attention is given to the port area where trapping and poisoning activities are conducted routinely in conjunction with inspection and general sanitation measures on and adjacent to the piers. Rodent retrievals are brought to the Hilo plague laboratory where they and their ectoparasites are examined for evidence of plague infection. In the plantation areas south and north of Hilo where plague was formerly found, trapping activities are carried on by plantation personnel working in cooperation with the department of health. The rodent catch is picked up daily by the department's dissector, transported to the laboratory, and examined for signs of plague.

Hundreds of thousands of rodents have been examined in the Hilo laboratory since plague disappeared from the Olaa-Laupahoehoe sector, and, to date, no evidence of a reappearance of plague in this area has been discovered.

Human plague has not been reported on the Island of Hawaii outside of the Hamakua District since 1918. (See fig. 2.) The presence of plague within this district was detected in March 1910 when a human case was reported from the village of Honokaa located 45 miles northwest from Hilo. Since that time, as shown in table 3, a total of 112 human cases have been reported from this region. Most of the cases have been reported from the area extending from Paauhau to Kukuihaele with the greatest number from the Honokaa area. Of the total number of cases reported, 108, or 96.4 percent, occurred below an elevation of 1,500 feet where approximately 90 percent of the people in this region reside or work. The remainder (3.6 percent) occurred at elevations between 1,500 and 2,000 feet. Eskey reported that there


ENDEMIC PLAGUE REGION
ISLAND OF HAWAII
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N
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KAPULENA AREA
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PAAUHAU
PAAUILO
ANINAU
OOKALA
WAIMEA
HONOKAA to KAMUELA 16 MILES
OOKALA to HILO 32 MILES
HAMAKUA DISTRICT
SOUTH KOHALA DISTRICT
NORTH HILO DISTRICT
20°-05'
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155°-25'
155°-20'
155°-15'
TERRITORY OF HAWAII
DEPARTMENT OF HEALTH
DIVISION OF SANITATION
BUREAU OF RODENT CONTROL
SCALE: 1:62,500

Figure 2.

Table 3. *Plague incidence, Hamakua, Hawaii, calendar years 1910–1949*

Year	Human cases	Rodent infections [1]	Year	Human cases	Rodent infections [1]
1910	3	8	1931	0	3
1911	5	3	1932	2	11
1912	7	86	1933	2	17
1913	4	15	1934	2	8
1914	4	3	1935	1	19
1915	4	12	1936	0	71
1916	0	[2] 6	1937	0	93
1917	5	22	1938	0	130
1918	0	2	1939	1	54
1919	7	19	1940	0	56
1920	4	[3] 7	1941	0	79
1921	4	3	1942	0	125
1922	12	14	1943	7	76
1923	1	16	1944	5	63
1924	2	17	1945	1	20
1925	1	7	1946	0	8
1926	7	4	1947	0	9
1927	7	10	1948	0	2
1928	8	11	1949	1	19
1929	5	13			
1930	0	4	Total	112	1,145

[1] Includes infections determined by tissue and flea pools.
[2] Includes one infection detected in vicinity of Ookala.
[3] Includes three infections detected in vicinity of Ookala. Politically this area is located in the North Hilo District but at present is included as part of the over-all region which is under surveillance by the Hamakua program.

was no evidence of plague above an altitude of 2,000 feet, and no additional evidence has been obtained which would alter this statement. There have been two periods of over 4 years when no human plague was reported; one of 56 months extended from March 1935 to December 1939 and one of 54 months extended from April 1945 to November 1949.

The laboratory diagnosis of plague in the Hamakua District is accomplished at the Honokaa laboratory. This laboratory has been constantly maintained by the Department of Health since it was established in May 1932. Prior to this time, with the exception of a brief period between 1911 and 1913, laboratory diagnosis was accomplished at the Hilo laboratory.

The Hamakua work district is divided into 37 work zones. A total of 1,145 plague infections in rodents or rodent fleas has been reported from 28 of these work zones extending from Ookala to and including Waipio Valley. Almost all of the infections (1,120 or 97.8 percent) have been reported from areas below an elevation of 1,500 feet, and the remainder (25 or 2.2 percent) have been from areas between 1,500 and 2,000 feet. The occurrence of rodent plague every year indicates no abatement of the infection in the region. In fact, the total number reported in recent years has been greater than the number reported prior to 1934. Although during the period 1910–46 most of the rodent plague had been found in the Paauhau, Hamakua Mill, and Honokaa areas, 31 of the last 36 rodent infections have been detected in the Honokaa, Kapulena, and Kukuihaele areas since 1946. During the 12-month period, January 1948 to February 1949, no plague was recovered

from rodents. This quiescent period was ended abruptly in February when three flea pools proved to be plague positive. Sixteen additional infections were reported in subsequent months. The first human case in 4 years was reported in November 1949.

The periodic recrudescence of human plague infection and the continued presence of plague in rodents and rodent fleas in this region necessitates the constant maintenance of a surveillance program which may serve as a basis for intensive plague suppressive measures.

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 January 27, 1951

For the current week the number of cases of measles was more than twice that for the same week last year. The largest numbers were reported in the East North Central, 1,922 cases, West South Central, 1,794, Middle Atlantic, 1,503, and Pacific States, 1,410.

The influenza cases for the country as a whole remain low, 2,455 cases as compared with 6,512 for the same week last year. The influenza-like infection reported in Gordo, Ala., last week was found to be very mild upon investigation. Material for isolation of virus was obtained from only 4 of the 250 cases reported to have occurred. The actual number of cases appears to have been overestimated. No unusual amount of respiratory disease has been noted in nearby communities.

Report of Epidemics

Botulism. Dr. W. L. Halverson, California, Director of Health, has reported one fatal case of botulism traced to a lot of Liederkranz cheese spread now called off the market. The victim had eaten about two-thirds of a jar of the cheese spread, and after an incubation period of from 8 to 10 hours, there were symptoms of nausea and vomiting followed by difficulty in swallowing. A clinical diagnosis of botulism was suggested before the patient died. Examination of the remaining contents of the jar of cheese revealed toxin and *Cl. botulinum*, type B. Records show that this cheese was manufactured in December 1949, and all of the lot bearing the number which was on the jar was shipped to California. About 40 jars have been recovered, and those which have been examined by the Food and Drug Administration have not shown evidence of botulinus toxin but did reveal the presence of some putrefactive anaerobes which have not been identified. No other cases of botulism are known to have occurred following ingestion of this food. Dr. Halverson also reported a case and one suspected case of botulism in another locality with the source of infection undetermined, and another case of unknown source in a third locality.

Gastroenteritis. Dr. R. M. Albrecht, New York State Department of Health, has reported an outbreak of gastroenteritis in a group of college girls. About 250 of 550 persons who ate supper in one dining hall were affected with nausea, vomiting, diarrhea, and fever after an incubation period of 10 to 14 hours. Food histories are not available, but the preliminary epidemiological investigation suggests that Swiss steak broiled in the morning and kept in a heating closet until supper may have been the source of infection.

Dr. W. L. Halverson has reported 17 cases of gastroenteritis in a California city. The symptoms were nausea, diarrhea, headache, and some fever. Some patients have been quite ill and many have had relapses.

Diphtheria. Dr. W. L. Halverson has reported an outbreak of eight cases of diphtheria in a single community of California. Three were children, of whom one died. The others were adults in a low socioeconomic group. There have been several suspected cases in the same area.

False Report of Water Pollution. The false rumor which started on January 1, 1951, in Birmingham, Ala., concerning the "poisoning" of its water supply has been investigated thoroughly by Federal, State, and local authorities. It is believed that this rumor was started by irresponsible persons who misread or misquoted a news article which had appeared a few days previously. These articles related to proposals for protection of public water supplies against pollution or sabotage. The near panic which resulted was allayed promptly by announcements from responsible health and other authorities that the water was "safe" and "pure."

Influenza. The United States Navy has received reports of an outbreak of influenza aboard one vessel in the Mediterranean following contact with ports of Spain. These outbreaks were characterized by their sharpness and the generally mild character of the disease. Only about one-third of the patients required bed rest of 24 hours or more. The type of virus has not been determined.

A report has been received of 40 cases of influenza on a British vessel which arrived in Havana on January 26. One death said to be due to influenza occurred while the vessel was at sea.

Information has been received from the General Register Office for England and Wales on deaths from all causes and from influenza,

	Peak week 1950–51		Peak week 1949–50	
	All causes	*Influenza*	*All causes*	*Influenza*
126 large towns	10, 328	1, 099	5, 955	52
Northern towns	868	113	430	12
Northwestern towns	2, 908	497	1, 140	17
Liverpool (C. B.)	949	216	245	4
Greater London	3, 415	252	2, 028	22

by weeks. The largest number of deaths reported in any 1 week between December 2 and January 20 as compared with peak weeks of the same period last year are shown above.

These data indicate that a more severe type of influenza has prevailed in England than was first reported, especially in the northern part of the country. For instance, in Liverpool, the number of deaths from all causes in the peak week (January 7–13, 1951) was nearly four times that for the peak week in the same period of 1949–50. Influenza deaths in Liverpool were 50 times greater when comparing the peak weeks of this year with those of last year. The mortality data which have been received also appear to indicate that the epidemic is now on the wane.

Influenza Information Center*

The director of the regional laboratory at Berkeley, Calif., Dr. Edwin H. Lennette, reports that three cases of influenza A have been diagnosed serologically. All three are from the Berkeley area and have the onset dates of January 4, January 8, and January 9, 1951. There is no unusual prevalence of influenza in this area.

The director of the regional laboratory at Ann Arbor, Mich., Dr. Thomas Francis, Jr., reports A-prime strain of influenza virus isolated from a case with onset January 19. There is no increase in prevalence in this area.

Comparative Data for Cases of Specified Reportable Diseases: United States

[Numbers after diseases are International List numbers, 1948 revision]

Disease	Total for week ended—		5-year median 1946–50	Seasonal low week	Cumulative total since seasonal low week		5-year median 1945–46 through 1949–50	Cumulative total for calendar year—		5-year median 1946–50
	Jan. 27, 1951	Jan. 28, 1950			1950–51	1949–50		1951	1950	
Anthrax (062)	2	1	2	(1)	(1)	(1)	(1)	6	2	4
Diphtheria (055)	89	199	250	27th	3,298	4,990	7,337	391	719	979
Encephalitis, acute infectious (082)	10	10	10	(1)	(1)	(1)	(1)	35	45	29
Influenza (480–483)	2,455	6,512	6,512	30th	[2] 22,755	50,007	53,611	[2] 8,213	19,477	19,477
Measles (085)	9,830	4,580	6,712	35th	60,108	36,029	46,409	31,407	16,899	20,285
Meningitis, meningococcal (057.0)	100	79	79	37th	1,380	1,265	1,265	419	352	350
Pneumonia (490–493)	1,578	2,104	-------	(1)	(1)	(1)	(1)	6,322	8,850	-------
Poliomyelitis, acute (080)	144	112	60	11th	32,812	41,949	25,096	593	475	299
Rocky Mountain spotted fever (104)	1	-------	-------	(1)	(1)	(1)	(1)	1	4	3
Scarlet fever (050) [3]	2,448	1,860	2,844	32d	[2] 23,743	22,605	32,718	[2] 8,052	6,166	9,688
Smallpox (084)	-------	1	2	35th	11	13	32	3	5	11
Tularemia (059)	19	24	26	(1)	(1)	(1)	(1)	65	107	107
Typhoid and paratyphoid fever (040,041) [4]	36	54	42	11th	3,087	3,541	3,566	172	168	166
Whooping cough (056)	1,675	2,888	2,117	39th	28,483	30,435	33,354	6,881	8,899	8,899

[1] Not computed.
[2] Additions—South Carolina: Influenza, week ended Jan. 13, 24 cases; scarlet fever, week ended Jan. 20, 7 cases.
[3] Including cases reported as streptococcal sore throat.
[4] Including cases reported as salmonellosis.

*National Institutes of Health, Bethesda, Md.

Reported Cases of Selected Communicable Diseases: United States, Week Ended Jan. 27, 1951

[Numbers under diseases are International List numbers, 1948 revision]

Area	Diphtheria (055)	Encephalitis, infectious (082)	Influenza (480–483)	Measles (085)	Meningitis, meningococcal (057.0)	Pneumonia (490–493)	Poliomyelitis (080)
United States	**89**	**10**	**2,455**	**9,830**	**100**	**1,578**	**144**
New England	**5**		**80**	**442**	**1**	**36**	**3**
Maine	1		76	3		5	
New Hampshire				5			
Vermont				176			
Massachusetts	4			245			1
Rhode Island				6	1	1	
Connecticut			4	7		30	2
Middle Atlantic	**10**	**1**	**7**	**1,503**	**12**	**229**	**19**
New York	5		[1] 4	345	7	90	14
New Jersey		1	3	326	2	67	1
Pennsylvania	5			832	3	72	4
East North Central	**6**	**4**	**23**	**1,922**	**21**	**108**	**10**
Ohio			20	556	11		
Indiana	4			63	1	7	
Illinois			3	289	5	63	2
Michigan	2	4		302	2	38	3
Wisconsin				712	2		5
West North Central	**4**	**1**	**12**	**772**	**10**	**58**	**7**
Minnesota	3		1	85	1	12	1
Iowa					1	1	2
Missouri	1	1	5	295	7	1	1
North Dakota			2	23		24	
South Dakota				36		5	1
Nebraska							1
Kansas			4	333	1	15	1
South Atlantic	**18**		**887**	**557**	**19**	**205**	**24**
Delaware				5			1
Maryland	1		1	14	1	45	1
District of Columbia			6	22		8	
Virginia	3		531	158		90	3
West Virginia			225	8	7	20	
North Carolina	2			173	8		4
South Carolina	5		96	7	2	18	1
Georgia	2		28	144		24	5
Florida	5			26	1		9
East South Central	**14**		**66**	**416**	**11**	**33**	**6**
Kentucky	3		6	122	2	13	1
Tennessee	4		58	161	3		
Alabama	6			32	5		2
Mississippi	1		2	101	1	20	3
West South Central	**16**	**3**	**896**	**1,794**	**12**	**709**	**17**
Arkansas	3	2	667	126	1	91	4
Louisiana	2			20		30	2
Oklahoma	3		229	189	2	35	
Texas	8	1		1,459	9	553	11
Mountain	**9**		**441**	**1,014**	**4**	**123**	**10**
Montana	2		47	16		3	
Idaho	3			38	1		1
Wyoming				50		8	
Colorado			129	674		32	6
New Mexico	3		2	15		18	1
Arizona			263	174		62	2
Utah	1			47	2		
Nevada					1		
Pacific	**7**	**1**	**43**	**1,410**	**10**	**77**	**48**
Washington	1	1	2	490	1	7	5
Oregon	1		27	30	1	28	2
California	5		14	890	8	42	41
Alaska						1	
Hawaii			1	2			

[1] New York City only. *Anthrax:* Pennsylvania, 2 cases.

Reported Cases of Selected Communicable Diseases; United States, Week Ended Jan. 27, 1951—Continued

[Numbers under diseases are International List numbers, 1948 revision]

Area	Rocky Mountain spotted fever (104)	Scarlet fever (050)	Smallpox (084)	Tularemia (059)	Typhoid and paratyphoid fever [1] (040, 041)	Whooping cough (056)	Rabies in animals
United States	1	2,448		19	36	1,675	140
New England		259				143	
Maine		19				43	
New Hampshire		12				3	
Vermont		7				57	
Massachusetts		181					
Rhode Island		11				20	
Connecticut		29				20	
Middle Atlantic		355			3	313	19
New York		[2] 181			1	105	19
New Jersey		55				110	
Pennsylvania		119			2	98	
East North Central		597		1	2	250	16
Ohio		177				48	4
Indiana		49				19	9
Illinois		88		1		26	1
Michigan		245			2	74	1
Wisconsin		38				83	1
West North Central		133		8	4	170	18
Minnesota		33				26	
Iowa		13				10	18
Missouri		29		3	3	8	
North Dakota		5			1	24	
South Dakota		4					
Nebraska		7					
Kansas		42		5		102	
South Atlantic		222		3	6	268	13
Delaware		7				3	
Maryland		28		1		11	
District of Columbia		5				8	
Virginia		31		1	2	76	1
West Virginia		11				17	1
North Carolina		78		1	2	89	
South Carolina		6				5	7
Georgia		37			2	30	3
Florida		[2] 19				29	1
East South Central	1	136		3	8	84	28
Kentucky		30				12	12
Tennessee	1	92			5	25	10
Alabama		13			1	46	5
Mississippi		1		3	2	1	1
West South Central		119			8	291	43
Arkansas		8			2	22	3
Louisiana		17			1	2	
Oklahoma		19			1	33	1
Texas		75			4	234	39
Mountain		208		4	3	90	1
Montana		30		3		10	1
Idaho		31				16	
Wyoming		1				4	
Colorado		20				21	
New Mexico		3				14	
Arizona		8			2	25	
Utah		[2] 115		1	1		
Nevada							
Pacific		419			2	66	2
Washington		122				14	
Oregon		43				12	
California		[2] 254			2	40	2
Alaska		1				4	
Hawaii		3					

[1] Including cases reported as salmonellosis.

[2] Including cases reported as streptococcal sore throat.

FOREIGN REPORTS

CANADA

Reported Cases of Certain Diseases—Week Ended Jan. 6, 1951

Disease	Total	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Brucellosis	4						2	1			1
Chickenpox	1,475			42		238	719	40	145	86	205
Diphtheria	6					3		2	1		
Dysentery, bacillary	10					1	2				7
German measles	268					10	146	1	6	30	75
Influenza	11			6			1	3			1
Measles	2,390	11		7	3	168	2,015	134	17	11	24
Meningitis, meningococcal	5						3			1	1
Mumps	1,461	2		27		136	590	35	212	262	197
Poliomyelitis	1										1
Scarlet fever	280	1				51	62	16	23	89	38
Tuberculosis (all forms)	215	5		2	11	148	19	13			17
Typhoid and paratyphoid fever	16					13	1				2
Venereal diseases:											
Gonorrhea	333	5		1	5	124	40	22	20	38	78
Syphilis	71	5				30	19		4		13
Primary	9					5			2		2
Secondary	6					2	3				1
Other	56	5				23	16		2		10
Whopping cough	236			5	4	62	122	16	1	3	23

NORWAY

Reported Cases of Certain Diseases—November 1950

Disease	Cases	Disease	Cases
Diphtheria	22	Pneumonia (all forms)	5,522
Dysentery, unspecified	6	Poliomyelitis	116
Encephalitis, infectious	6	Rheumatic fever	85
Erysipelas	323	Scabies	1,037
Gastro-enteritis	2,251	Scarlet fever	151
Hepatitis, infectious	40	Tuberculosis (all forms)	289
Impetigo contagiosa	2,142	Typhoid fever	1
Influenza	27,089	Venereal diseases:	
Malaria	1	Gonorrhea	181
Measles	721	Syphilis	57
Meningitis, meningococcal	21	Other forms	1
Mumps	62	Whooping cough	1,754
Paratyphoid fever	1		

MADAGASCAR

Reported Cases of Certain Diseases and Deaths—November 1950

Disease	Aliens		Natives	
	Cases	Deaths	Cases	Deaths
Bilharziasis			19	
Diphtheria			2	
Dysentery:				
Amebic	1		151	4
Bacillary			23	1
Erysipelas			6	
Influenza	1		2,679	10
Leprosy			49	
Malaria	116	2	24,070	128
Measles	3		160	1
Meningitis, meningococcal			5	1
Mumps	6		103	
Plague			29	22
Pneumonia (all forms)	3	1	807	69
Puerperal infection			3	
Relapsing fever			1	
Tuberculosis, respiratory	8	3	101	16
Typhoid fever			6	3
Whooping cough	1		223	3

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

The following reports include only items of unusual incidence or special interest and the occurrence of these diseases, except yellow fever, in localities which had not recently reported cases. 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. During the week ended January 20, 1951, 76 cases of cholera were reported in Calcutta, as compared with 41 for the previous week. In Negapatam 15 cases were reported for the week ended January 20, as compared with 10 for the previous week.

Smallpox

Belgian Congo. During the week ended January 13, 1951, 47 cases of alastrim were reported in Belgian Congo. For the week ended January 6, 64 cases were reported.

Cameroon (British). For the week ended December 2, 1950, two cases of smallpox were reported in Victoria.

French Equatorial Africa. During the period December 21–31, 1950, five cases of smallpox were reported in French Equatorial Africa. These are the first cases since September 20.

India. For the week ended January 20, 1951, smallpox was reported in ports of India as follows: Calcutta, 401 cases; Madras, 75; and Bombay, 44.

Iraq. For the week ended January 20, 1951, 31 cases of smallpox were reported in Iraq, as compared with 10 for the week ended January 13.

Tanganyika. During the week ended December 16, 1950, 42 cases (8 deaths) were reported in Tanganyika.

Typhus Fever

Indochina. For the week ended January 13, 1951, two cases of typhus fever were reported in Viet Nam.

Puerto Rico. Two cases of murine typhus fever were reported in San Juan for the week ended December 2, 1950.

Turkey. During the week ended January 20, 1951, one case of typhus fever was reported in Istanbul.