

Innovative Communicable Disease Reporting

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THE REPORTING of communicable diseases by physicians remains incomplete despite the demonstrated benefits of alert surveillance of these ill-

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nesses (1). In a recent investigation of physicians' attitudes, Cleere and co-workers concluded that completeness of reporting was related directly to the physician's degree of confidence in his local health department (2). Therefore, it seemed that the reporting of communicable diseases might be enhanced if the relationship between physicians and health departments were improved.

An opportunity for such enhancement was provided in 1966 when the Rhode Island General Assembly passed a legislative program reorganizing the public health services in this State. As an efficiency measure, all local health jurisdictions were eliminated, the total public health responsibility being placed in the State department of health. An experimental system for reporting communicable disease was instituted in which (a) the individual physician's routine reporting responsibilities were reduced, (b) a small, geographically dispersed group of physician-consultants was established, who were paid

to report regularly in detail, and (c) there was rapid, regular feedback of surveillance information to all interested physicians in a format that they found useful. In a 3-year trial, this system increased reporting of communicable disease and improved communication between the health department and physicians. It was adopted as standard practice in Rhode Island in 1969 and might serve as a model for other health jurisdictions in this country.

Systems for Reporting Disease

Under the former system for reporting communicable disease in Rhode Island, variations of which most health departments in this country use, all licensed physicians were provided morbidity report cards to be filled in and returned to local health departments at least weekly. Local health departments in turn reported weekly to the State health department. Numerical estimates of some illnesses, such as streptococcal and staphylococcal infections, were requested, as well as

the specific identity of patients with certain other diseases— hepatitis, salmonellosis, and so forth. Correlated surveillance information was published as a monthly statistical summary which had little relevance to physicians in day-to-day practice. Since physicians gained little from their reporting efforts, they became lax. Some of them expressed the candid opinion that their reports served merely to keep remote statisticians occupied.

The experimental reporting system was conceived with the following goals in mind: (a) to improve the reporting of those diseases of greatest public health importance, (b) to provide useful information to practitioners, (c) to determine trends in incidence of the numerous poorly delineated infectious syndromes

which, though not usually considered reportable, cause significant morbidity, and (d) to minimize the work of individual physicians. Nahmias and McCroan (3) had described an informal surveillance system they conducted in the Atlanta, Ga., area, which provided a useful blueprint for our experiment.

Under the new regulations for reporting morbidity, the reportable diseases were reclassified by epidemiologic priorities (4), and the weekly reporting card was eliminated (see box). Practicing physicians were thereby freed from the chore of routinely reporting many common diseases, but they now were required to notify the health department within 24 hours (by mail or phone) whenever they diagnosed an illness of immediate public health importance. Physicians re-

porting such cases were offered prompt epidemiologic investigative assistance, thus making the reporting mechanism pertinent to them and to their patients.

In addition, a special paid panel of physicians (honorarium \$100 per year) was recruited as "consultants" to report each week all the communicable illnesses they observed in their own practices. Their reports provided information on the incidence and clinical characteristics of less well-defined syndromes, such as illness with a rash, gastroenteritis, and respiratory infections, as well as on specific infections such as mumps, chickenpox, or streptococcal disease. The consultants were selected from physicians who previously had expressed an interest in infectious diseases or public health. Most were general practitioners or pediatricians. A precise

Reportable Communicable Diseases, Rhode Island, 1969

Category I. Diseases of General Interest

Reporting by selected consultant practitioners. Identity of patient is not required.

Aseptic meningitis
Chickenpox
Influenza
Mumps
Staphylococcal infections
Streptococcal infections
Whooping cough

Communicable syndromes:
Febrile illness
Gastroenteritis
Rash illness
Respiratory infections

Category II. Diseases of Immediate Public Health Importance

Reportable by all physicians within 24 hours of diagnosis or suspected diagnosis. Identity of patient, age, sex, and address are required.

Amebiasis
Anthrax
Botulism
Brucellosis
Cholera¹
Diphtheria
Encephalitis, arthropod-borne
Epidem.c diarrhea of the newborn
Hepatitis, infectious²
Hepatitis, serum²
Histoplasmosis

Leprosy
Leptospirosis
Malaria
Measles²
Meningococcal meningitis²
Ornithosis (psittacosis)
Poliomyelitis²
Plague¹
Rabies
Relapsing fever
Rheumatic fever

Rickettsioses (including typhus)¹
Rubella (including congenital rubella)²
Salmonellosis (including typhoid)²
Shigellosis²
Smallpox¹
Tetanus
Trichinosis
Tularemia
Yellow fever¹

Category III. Tuberculosis and Venereal Disease

Separate reporting mechanisms exist which were not evaluated in our study.

¹ Internationally quarantinable disease.

² Disease of special interest to the health department.

**Morbidity reporting under old system for fiscal 1958-65
and under new system for fiscal 1966-69, Rhode Island**

Communicable disease	Old system—all physicians reporting		New system—40 consultants reporting	
	Cases ¹	Rate per 1,000 ²	Cases ¹	Rate per 1,000 ²
Chickenpox	2,343	2.55	2,804	3.11
Mumps	1,724	1.97	2,782	3.09
Streptococcal infections	2,144	2.44	4,481	4.96

¹ Average annual number of cases reported.

² Average annual morbidity rate adjusted for yearly increases in population.

statistical sampling of the Rhode Island population could not be obtained by this approach; nevertheless, all major geographic areas were represented.

While physicians bear the main responsibility for reporting, we believe that health departments bear a reciprocal responsibility to make morbidity information readily available to physicians in a useful form. The division of epidemiology of the Rhode Island Department of Health therefore distributed, without charge, a weekly *Communicable Disease Newsletter* to all interested physicians. It was a single mimeographed page of short conversational paragraphs (“breezy” said one reader). The newsletter avoided tabulations of data and aimed at providing timely information on local trends in infectious disease. This informal commentary usually was in the hands of physicians within 1 week after the division received the raw data from the consultants.

Assessment of New System

Forty physicians participated as consultants throughout the 3 years of the experiment, from July 1966 through June 1969. An average of 30 reports were received from them each week (75 percent of them reporting). Vacations and attendance at

medical meetings accounted for many of the failures to report.

To assess the improvement in morbidity reporting under the new system, three diseases were selected for analysis—chickenpox, mumps, and streptococcal infections. These diseases, previously reportable by all physicians, were reported only by the consultants under the new system. Also, the incidence of these diseases had been altered very little by medical advances during the years under consideration. The average annual morbidity rates per 1,000 population (see table) were found to be significantly greater ($P < 0.01$) for all three diseases after the change in reporting methods. It is unlikely that the increase in reporting of chickenpox and mumps was due to their cyclical nature; this possibility is even less likely for streptococcal illness. Thus, as crude as our comparison is, it shows plainly that the 40 interested and paid consultants reported more cases in each of the 3 fiscal years than all the physicians in Rhode Island had reported in each of the previous 7 fiscal years!

The consultants were asked to estimate the size of their practices. On the basis of their returned questionnaires, the consultants’ collective practices in-

cluded approximately 23 percent of Rhode Island children through 14 years of age and some 5 percent of those 15 years and older, or approximately 10 percent of the State’s population. Thus, to estimate statewide incidence of diseases primarily affecting children (for example, mumps), the reported total could be multiplied by a factor of at least 4, while for those diseases affecting the entire populace (for example, influenza), a factor of at least 10 would certainly not be inappropriate. Clearly, the traditional system must always remain inadequate for the task of reporting since the degree of underreporting is never known. It is only with the introduction of more complete reporting of illness from a subpopulation of known size that statewide morbidity can begin to be estimated.

Also, under the new system, sizable epidemics often were reported more promptly and precisely, and outbreaks of illnesses not usually considered reportable were recognized. The A2 influenza outbreak in 1967 provides an example of the increased rapidity in recognizing epidemics. By the week ending December 16, 1967, although influenza cases had been confirmed in a number of other States (5), only scattered cases of the influenza syndrome had been observed in Rhode Island, and none were confirmed serologically. The health department was monitoring school absenteeism, but the sensitivity of this surveillance technique was blunted by the presence of considerable “non-specific” upper respiratory infection, seasonal truancy, and the Christmas vacation. For the week ending December 30, however, consultants representing virtually

all areas of the State independently reported many cases of classical influenza illness (see chart). Serologic confirmation soon followed. The consultants' reporting mechanism had provided the most prompt notification of influenza activity of the surveillance techniques concurrently operative.

The common, poorly defined upper respiratory, gastroenteric, and minor exanthematous illnesses of childhood are not usually considered reportable although they cause enormous morbidity and constitute a daily problem for the practicing physician. Health departments rarely offer any help in ascertaining their etiology, incidence, or geographic pattern of spread. Investigation of a consultant's report of an "unusual exanthem" revealed a cluster of cases of erythema infectiosum, an illness which subsequently became epidemic statewide. The continuing reports in the newsletter enabled physicians to anticipate the arrival of this illness in their area, to view their own patients' illnesses from a broader perspective, and to provide reassurance to the parents of affected children.

Newsletter

The *Communicable Disease Newsletter* appeared to be one crucial determinant of the success of the new reporting system. Not only did the newsletter have to be accurate and timely; it also had to compete for the physician's reading time. Its casual format perhaps provided its allure. The outbreak of epidemics, information on the clinical characteristics of illnesses, epidemiologic speculations, and even the results of specific investigations

can be communicated through this medium in a manner to interest a busy practitioner.

For example, in the newsletter for the week ending September 19, 1969, the impact, in specific areas, of one of the common syndromes, respiratory illness, was shown.

The metropolitan area experienced a quiet week while the northern part of the state had a substantial increase in respiratory illness which not infrequently was accompanied by moderate nausea, mild vomiting and diarrhea. Reports from the south revealed intermediate morbidity . . .

Mounting morbidity in the State from another common syndrome, hepatitis, was mentioned. The following warning was also issued about enteric pathogens:

Salmonella infections have occurred at a high rate . . . Families should beware of the threat of dime store pet turtles . . . cultures taken during several investigations of turtle food and water have commonly yielded various salmonella species . . .

Among the "less common problems" touched upon, were swimmer's itch and a typhoid carrier discovered in the State. Reporting on the carrier, the writers of the newsletter stated:

Last summer we wrote of a newly discovered carrier of *Salmonella typhi*. This 55 year old lady completed a 200 gram course of ampicillin over an 8 week period and we are gratified to report that in the month since conclusion of therapy, she has had three negative stool cultures. This protocol is successful only when the biliary tree is normal. If gallstones are present, it is best to proceed directly to surgery . . .

Perhaps the most satisfying measure of the impact of the newsletter was a complimentary editorial which appeared in the *Rhode Island Medical Journal* (6), a publication of the State medical society. "Among the avalanche . . . of reading matter

which crosses our desk . . . is [the *Communicable Disease*] Newsletter. It is well written, succinct and readable. We congratulate the Health Department on . . . this useful publication."

Discussion

The control of communicable disease is critically dependent upon the receipt of data on the occurrence of disease. In this country, surveillance consists largely of reporting by practitioners whose responsibility to the community is defined in the communicable disease reporting laws of the various States. In accepting a license to practice, physicians agree to comply with these laws. Yet, communicable disease reporting is strikingly incomplete. Despite this impediment, work at the Center for Disease Control had demonstrated the value of surveillance of certain diseases (1).

As successful preventive methods for more diseases are developed, additional surveillance mechanisms will be required. Therefore, the list of reportable diseases can be expected to expand steadily. Measles and rubella provide contemporary examples; both were underreported until safe and effective vaccines were developed. Measles eradication programs required special intensive surveillance methods (7), and evaluation of rubella control programs has required the development of new reporting systems for birth defects, including the congenital rubella syndrome.

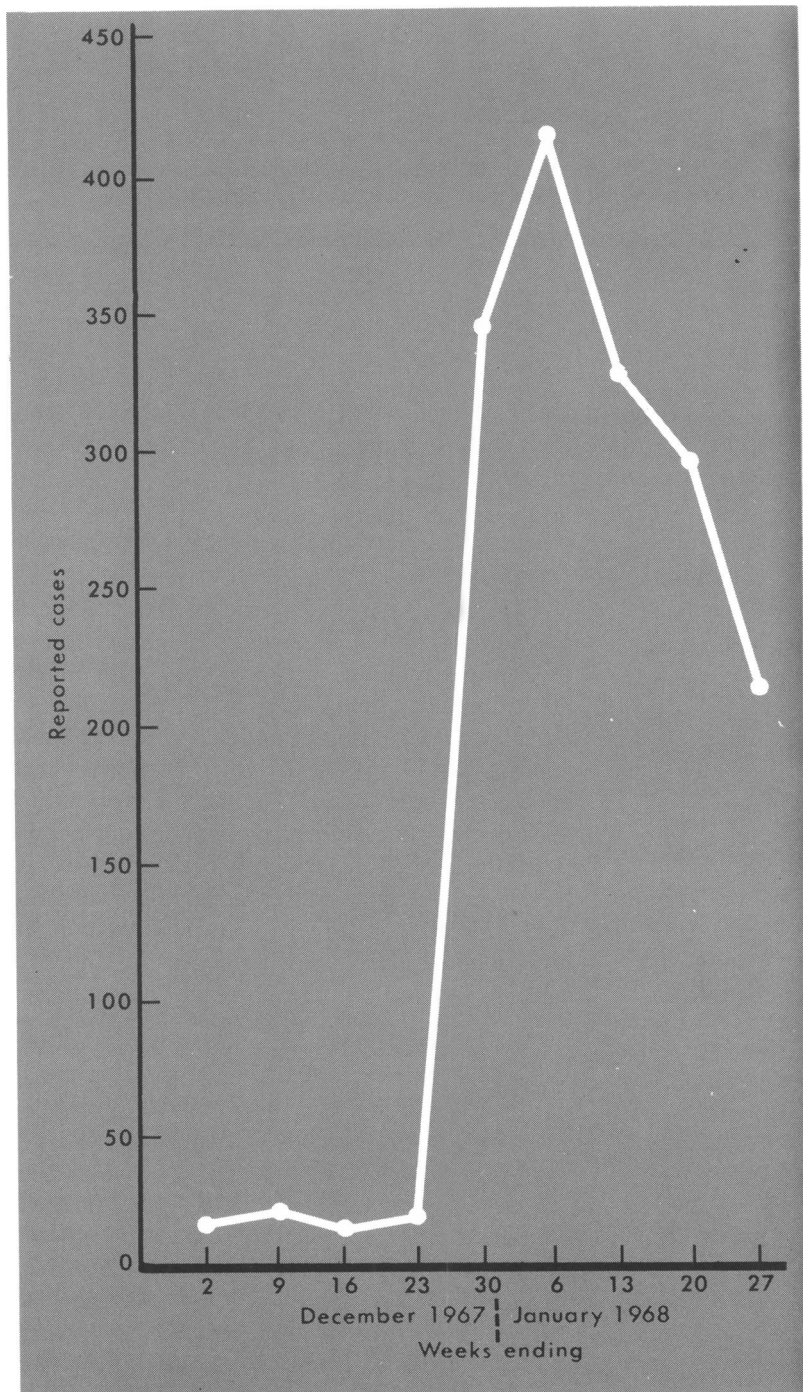
Three of the four goals of the experimental system were achieved handily. For example, the obligation of the practicing physician to report communicable diseases was reduced, and in-

terested physicians now are provided with more useful and timely information on local communicable disease trends than before. Also, well-defined infectious

entities are now recognized (albeit imperfectly), and their occurrence is followed in different areas of the State; the practitioner can be informed of "what

is going around." Nevertheless, despite the superior information that the experimental system provided on some illnesses, it did not completely rectify the deficit in reporting. Supplementary surveillance mechanisms can partially fill this gap. For example, cases of hepatitis frequently are discovered by monitoring the State's immune globulin distribution program and reviewing hospital admissions.

Cases of influenza syndrome reported by consultants in December 1967 and January 1968



Despite the inadequacies of conventional surveillance systems for communicable disease, departures from tradition have been exceedingly rare. We were able to learn of only three others. The Atlanta system (3), established in 1965, is still operative although reports are now issued biweekly rather than weekly. In Rochester, N.Y., a similar mechanism, emphasizing the rapid feedback of information to practicing physicians, was developed by Dr. Lowell A. Glasgow, formerly associate professor of microbiology and pediatrics at the University of Rochester School of Medicine and Dentistry. Also, clinical vignettes and comments on the antimicrobial sensitivities of common bacterial pathogens were presented, making the mechanism useful for postgraduate education. The Omaha-Douglas County (Nebr.) Health Department initiated such a program, which faltered, however, when the responsible person left the area. The program has been described by E. J. Sills and E. D. Lyman of the Omaha-Douglas County Health Department in an unpublished manuscript entitled, "Disease reporting in one metropolitan area" (1968).

All such efforts have been informal rather than official, in that the information collected does

not enter health department morbidity registers. Consequently, these data have no impact on epidemiologic conclusions that are drawn from a study of official morbidity statistics, and analyses of these statistics, however imperfect, often determine regional and national priorities for disease control and research. Such paradoxes, rather than negating the contributions of these new reporting mechanisms, emphasize the need for yet further innovation.

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An experimental communicable disease surveillance system, incorporating 40 paid community physician consultants and stressing rapid feedback of information to all interested physicians, operated successfully in Rhode Island for 3 years. Although it reduced the responsibility of most other physicians for routine reporting of communicable disease, the total number of cases of many common syndromes reported actually increased. Since the subpopulation on which the consultants reported regularly was of known size, better estimates of statewide morbidity could be made. In addition, improved information was obtained on the incidence of numerous minor communicable

diseases, and more rapid recognition of major epidemics resulted.

The swift return of pertinent information in readable style to all interested physicians appeared to improve relations between the health department and practicing physicians generally and often resulted in prompt notification of epidemiologically significant events which otherwise would have gone unreported. The new system clearly documented the value of innovation and emphasized the need for further experimentation. Although not the final answer to complete communicable disease surveillance, the new system has been adopted as standard procedure in Rhode Island.