SOME ASPECTS OF MORBIDITY SURVEYS

BY

E. R. BRANSBY, Ph.D.

Social Economist, Ministry of Health

Morbidity surveys must be included among newer applications of the social sciences. The contribution made to human welfare by the social sciences is exemplified by such pioneer work as that of Simon and Chadwick on the sanitary conditions of the working classes, of Booth and Bowley on the extent and causes of poverty, and of Cathcart and Orr on the prevalence of undernutrition. Social investigations have had an influential effect on public and official opinion and have been the direct or indirect cause of social planning and legislation over a wide field. The data obtainable from morbidity surveys may well be equally influential in regard to the health services of the nation.

Health and Sickness.—Before reviewing the various aspects of morbidity surveys, it is worth while to consider the definition of sickness or morbidity and its relationship with health, on which opinions differ. Downes and Collins (1940) say, "Illness, as normally understood, is an affection or disturbance of health," but Stocks (1947) holds that "in the definition of sickness the mystical word health, about whose meaning nobody seems to be agreed, must be avoided." But if sickness cannot be defined simply as a departure from health, or "an affection or disturbance of health," the implication is that there is some third state, such as being off-colour, intermediary between health and sickness. It can be argued that sickness should no more be limited to objective physical conditions than undernutrition, for example, to marked deficiency states. At least for most practical purposes it is sufficient to accept a simple definition like that of Downes and Collins, no matter what may be taken as the definition of health. The important aspect is not the definition but a clear and precise description of the information presented in any survey.

Types of Morbidity Surveys

The sickness data in morbidity surveys are obtained either from doctors or from lay persons. Some matters affecting clinical and lay diagnosis are considered below.

Clinical Diagnosis

Many factors influence the completeness of a clinical diagnosis. Muench (1947) puts the matter succinctly: "If we stop to think we must realize that medical diagnosis is definitely stratified into many areas of reliability." Methods of treatment also vary between doctors. Thus in the inquiry into epidemics in schools (Medical Research Council, 1938) ringworm was at first reported only if involving loss of school time; treatment, however, varied so much that eventually cases were reported whether school time was lost or not. Different standards of normality may be adopted—a criticism which has, for instance, been levelled against the clinical assessment of nutrition. All such factors introduce the possibility of non-random bias.

The clinical information on national health insurance certificates has important limitations. It is often vague and indefinite, may relate only to a sign or a symptom, the underlying condition being omitted, and to an early diagnosis. Bradford Hill (1937) reports 313 cases in which the first diagnoses were gastritis or gastro-enteritis but of which only three-quarters would, on the final diagnosis, have remained in the gastric group. Stocks (1947), indeed, emphasizes the advantage of information obtained from lay persons who know the course of the sickness as a whole compared with data based on early diagnoses. Difficulty of classification arises when two or more causes are given for a single condition. In any case, many minor conditions causing only a day or two's absence from work are not certified.

If in a survey it is intended to obtain sickness data clinically diagnosed, not only must the possibility of non-random bias

be considered, but also whether diagnoses could satisfactorily be made by an unselected sample of doctors or a group of doctors trained to work to the same standards, or only by one doctor.

Information Provided by Lay Persons

In some sickness surveys the sickness data are provided by lay persons, usually housewives, in respect of themselves or other members of their family, these data including both diagnoses by doctors and sickness for which no medical opinion has been sought. Such a procedure is beset with difficulties.

Lack of Knowledge.—(a) In an examination of 1,592 workers, all under national health insurance, Morris (1941) found that 112 had major disorders, and of these only 12 were or had been recently under medical care. Of 252 who had varicose veins, classified as a minor condition, only 7 had ever consulted their doctor about them. For the most part, the major and minor disorders were neglected or unsuspected. The same sort of thing was found at the Peckham Health Centre. Hence in sickness surveys many real ailments remain unreported. (b) Knowledge of sickness depends on such factors as the extent to which medical advice has been sought and the previous experience of sickness, either personally or in others. These depend, for example, on whether the patient has been accustomed to seek medical advice and on the sickness history of the informant's family. (c) Informants in different social groups or different states of health have different standards of normal health, and will report only deviations from these standards.

Psychological.—(a) Some "make the most" of sickness, supposed or real; others are proud of their "good health" and reluctantly report sickness. (b) Some conditions will not be freely reported because of social stigma. (c) The self-assessment of health will be influenced by propaganda and the state of morale.

Effect of Memory.—(a) The longer the previous period about which information is required the less its completeness and accuracy (Sydenstricker, 1926; Downes and Collins, 1940; Stocks, 1947). Stocks suggests that this relates only to minor ailments, but he also suggests that something more than a time factor influences loss of accuracy—for example, the more free reporting during an influenza epidemic and the less free when it is passed. (b) The faculty of recalling events probably depends on the intelligence of the informant, which in turn varies with factors such as social class.

Reporting in Respect of Another Person

This assumes unrestricted confidence between the informant and those for whom she is reporting, and that the informant will equally remember their sickness experience. But she may take a special interest in some persons and not in others. Mothers of large families are likely to forget more than mothers of small families.

These factors are very likely to cause bias when associating sickness data with environmental data. Thus a woman of lowly social standing with chronic heart disease may be unaccustomed to consulting a doctor and may be unaware of the nature of her condition; a person in better circumstances may do so and thus be aware of it. A mentally subnormal mother of a large family will forget the ailments of her children, while a mother who voluntarily limits her family will remember the ailments more completely. The mother of a small family or one with adequate domestic help will more readily go to bed if ill than one with a large family, tied to her household duties. This point is well made by Spring Rice (1939), who says: "She [the working class wife] firmly believes that her home and family would collapse if her work was interrupted by a sojourn at a hospital or even by the necessity of lying down or resting in bed for a few hours a day, and she therefore refuses to admit that she is ill until these disastrous interruptions to her work can no longer be avoided."

The following two items illustrate how spurious relationships may result by correlating biased data, although it is not suggested that the results obtained are entirely due to using such data.

(1) Downes (1947) studied the incidence of chronic sickness among spouses from data collected in a sample survey; only those chronic conditions confirmed by a physician were used in the analysis. The

diagnosis of a chronic condition in one spouse will, however, tend towards its easier self-diagnosis in the other, this in turn leading to an examination by the physician.

(2) A study of the incidence of sickness of children as reported by the mothers showed that there were "healthy" and "unhealthy" families (Downes, 1945). This would arise simply if some mothers exaggerate and others minimize the sickness experience of their children.

Detailed Surveys of Selected Population Groups

These surveys have the nature of well-controlled investigations. The data collected may relate only to sickness or may include environmental and other aspects. The sickness may be a single condition, a related set, or all conditions. Seldom can all clinical aspects of an inquiry be kept under direct and constant clinical supervision. In surveys among persons living at home, unless there is regular, say daily, home visiting by the doctor, whether or not the doctor is called to the subject depends on a lay estimate of the need, which in turn may vary from person to person. There is undoubtedly great difficulty in getting reliable sickness data for individuals or families living at home. The Ministry of Health, in its nutrition surveys, failed in its efforts to get sufficient of a random sample of housewives to attend a clinic for a limited clinical examination. The difficulties increase if the subjects are expected to attend on several occasions over a period. The scope of investigations involving, say, the family is thus at present very limited.

Groups such as children or work-people who attend a particular place are excellent subjects for study. The kind of data which might be obtained in a study that continues over some length of time would be drawn from three sources: (a) Clinical overhauls, say every six months, these being as comprehensive as possible. (b) Daily clinical examinations to ascertain whether or not a child is sick even though not absent from school. A nurse, in association with the teachers, and with help from a doctor when required, might be able to do this. (c) Clinical assessment of those conditions causing absence from school. Medical certificates, to include the final diagnosis, could be obtained for absence of more than a few days. Uncertified short-time sickness could be checked by a school nurse.

Surveys Based on Absence from School or Work

In studies of sickness causing absence from school the usual method of inquiry is to track down the causes of absence by means of doctors' certificates, home visits, and notes from parents, enlisting the co-operation of teachers, school nurses, and school inquiry officers. The data collected include medically certified sickness, and uncertified sickness based on diagnoses or descriptions of symptoms by the parents which are not considered serious enough to warrant medical consultation. The parents' intimate knowledge and constant appraisal of the child's capabilities and condition are fully utilized, as are the teachers' and nurses' knowledge of the various aspects of the child's life. Only sickness causing absence from school is recorded. This is probably fairly complete for certain conditions, such as infectious disease, while for others it may suffice for many purposes. What these conditions are deserves investigation. Absence due to sickness may vary between schools, for reasons other than real differences in sickness rates. Thus, the "atmosphere" in one school may encourage children to be absent for minor conditions, whereas in others it may do the reverse. A mother may believe that a sick child will be better off going to school than staying in a noisy restless home, while the opposite may be thought by a mother where the home is quiet and restful. School meals may be an inducement for attendance, and so on. The same sort of thing applies in residential schools. Thus even when absence is medically certified differing adjustments may be reached between the teaching and medical staffs on the severity of the conditions that warrant absence, and this may vary, for example, owing to school examinations.

The dangers of using absenteeism to measure and compare sickness among work-people have been discussed by Stocks (1944), who, speaking of medical certification under the National Health Insurance Act, says that the rates are "affected by changing attitudes to the relative importance of keeping at work and of safeguarding the health of the people

affected. These attitudes in turn are affected by economic conditions, amount of unemployment, wage rates, benefit rates, health propaganda and education." Bashford (1942) shows that such a simple matter as a change in supervision in an office reduced sickness absence by about 50%.

Surveys by General Practitioners

The collection of morbidity statistics from general practitioners may well prove a fruitful source of information, limited, of course, to those conditions receiving medical attention. In a recent survey in Canada (Richter, 1948) the demand for health care was compared for two population groups—one representing the panel of several insurance doctors, and the other served under the fee-for-service system. Records were supplied by the doctors of all illnesses which received medical attention over a period of twelve months as well as the type of care given.

Sample Surveys of Families or Individuals

In sample surveys a random sample of individuals are interviewed in their homes and asked what sickness they or members of their families have experienced over some previous period. The information is usually collected by non-medical investigators, who do not, however, make any "diagnosis of complaints" (Stevenson, 1947) but record what they are told. No definition of sickness is imposed or set up, the informant reporting those conditions of which she is aware and which she "considers to be of sufficient importance to be remembered and designates as such" (Collins, 1933). The information coming from lay persons suffers from the drawbacks previously mentioned, and will be subject to many kinds of bias. Moreover, as Ryle (1946) points out, "Even though crude assessments may seem justified when the samples are large, the findings cannot then be given a high valuation."

The sickness data are obtained at a single interview relating to the day of the inquiry (Perrott *et al.*, 1939) or to a previous period of two or three months (Stocks, 1947), or by a series of visits at intervals of a month or more to collect data over a period of several months (Sydenstricker, 1926; Collins, 1933; Downes and Collins, 1940). The methods of survey are basically the same, although, in some, refinements such as checking the diagnoses by reference to physicians have been introduced. Their accuracy differs according to the effort asked of the memory. The data collected relate (1) to sickness for which medical advice has been sought, representing about 30–50% of the total sickness reported—for most, but not all, diseases this is probably reported with sufficient reliability—and (2) to sickness for which medical advice has not been sought, the diagnoses or descriptions of symptoms being based on non-medical opinion. The *Lancet* (1947) suggests "that reliance on the patient's own diagnosis is probably not a source of serious error, for when, in a similar survey in the United States, the diagnoses were referred to the doctor for confirmation, there was agreement [with the patient's diagnosis] in 90% [of cases]." This, however, is not so, as the 90% relates only to sickness clinically diagnosed and not to the total sickness recorded.

An interesting difference of treatment is accorded to acute and chronic conditions. An acute condition is recorded if it occurs to the knowledge of the informant, but "a chronic impairment of disease generally appears in the illness record only when it causes some distress or is the subject of a medical consultation or examination" (Collins, 1933). A chronic condition, even though quiescent, may have greater influence on the way of life than a transient acute condition, yet the former is not recorded even though known to the informant, while the latter is.

The question arises as to the relative value of sickness data collected in sample surveys by doctors (Walker, 1947; Sheldon, 1948) and by trained social investigators. The social investigator asks a number of set questions and records the answers without putting her own interpretation to them. Sheldon's (1948) method is as follows: "Apart from what was actually visible the only information available was the account by the individual of his symptoms. . . . Once the interview was well under way most subjects were willing to describe their complaints (if any) and answer questions in such a way that an intelligent guess of the underlying diagnosis could usually be

made." The doctor can thus use his medical knowledge to develop the interview in the most profitable directions. Further, "in spite of the obvious limitations of a survey by interview only, the results merit description since they illustrate the extent to which various types of complaints restrict the activities of old people." This raises the interesting point, To what extent could the symptoms be satisfactorily recorded by lay persons? Sheldon states that he found considerable discrepancies in the sickness data recorded by himself and by lay investigators, but gives no details. His own inquiry was limited to conditions confirmation of which did not depend on clinical examination, but he suggests that an expert examination, including a physical examination, of a random sample might be possible for certain conditions. Is it possible that lay persons can satisfactorily obtain information on certain conditions, the symptoms of which are readily recognized and assume importance only when the patient is aware of their presence? It is to be noted that in the investigations on the common cold (Andrewes, 1948) the lay subjects record their symptoms, and the doctor then decides whether or not they had a cold.

Formulation of the Problem

The planning and execution of a morbidity survey require that the purpose and objectives of the survey be defined with clarity and precision; that the scope and limitations of the method of survey be recognized; and that the survey as planned will in fact give the information which it is intended to obtain. What is eventually included will be a compromise between what the investigator would like to conclude, whether the criteria can in fact be assessed or measured, and whether the facilities are available for doing so. This process can be illustrated by a proposed inquiry into the loss of working capacity due to chronic sickness. To be decided are the definition of chronic sickness and the criteria for loss of working capacity. There is no hard-and-fast definition of chronic sickness, and it is feasible that the meaning adopted will depend on the objects of the inquiry. In some employments the loss of working capacity may be directly measurable by loss of output, but in others it may be possible to measure only loss of working time—that is, absenteeism—and it may or may not be possible to assess how much of this is due to chronic sickness. Even then what causes incapacity in some employments may not do so in others. The final form of the inquiry may thus be greatly restricted and the results open to many reservations.

Discussion

The purpose of morbidity surveys is to provide data on the incidence, social pattern, and method of spread of sickness, and thus produce a basis for the planning of the health services. This falls into two parts, the action required to prevent disease and the services necessary for treatment, or as Ryle (1946) puts it, "social planning and political action." The various kinds of surveys are not alternatives, but provide information of different kinds, each contributing to the picture as a whole, but only to the extent that the information presented is reliable. Small detailed surveys, especially if the results are tested by repeated inquiry, are obviously of special importance.

There is an urgent need for research into all aspects of morbidity surveys, not only in regard to methods of field inquiry but also in regard to related matters such as the criteria for various environmental factors and the statistical treatment of data. The recent difference of opinion between Woolf and Waterhouse and Buckatzsch (Buckatzsch, 1947) on the method of estimating the effect of inter-correlated social data on infant mortality illustrates the need for statistical research, the application of which to social inquiries has been neglected. The dearth of essential "tools" is due in part to the urgency of the tasks which have faced social scientists, which has led them to "get on with the job" instead of devoting their energies to developing and assessing methods. The future of social surveys, including morbidity surveys, depends on the developing and testing of techniques. The aim in social

inquiries should be to impose the same standards of controlled experiment and investigation as are applied in the natural sciences.

REFERENCES

- Andrewes, C. H. (1948). *Med. Offr.*, **79**, 55.
 Bashford, H. (1942). *Lancet*, **2**, 289.
 Buckatzsch, E. J. (1947). *Population Studies*, **1**, 229.
 Collins, S. D. (1933). *U.S. publ. Hlth Rep.*, **48**, 283.
 Downes, J. (1945). *Amer. J. publ. Hlth*, **35**, 593.
 — (1947). *Millbank mem. Fd Quart.*, **25**, 334.
 — and Collins, S. D. (1940). *Ibid.*, **18**, 1.
 Hill, Bradford A. (1937). *Med. Res. Coun. Ind. Hlth Res. Bd.* No. 79. London.
Lancet Editorial (1947). **1**, 753.
 Medical Research Council (1938). *Spec. Rep. Ser.* No. 227. London.
 Morris, J. N. (1941). *Lancet*, **1**, 51.
 Muench, H. (1947). *Amer. J. publ. Hlth*, **37**, 1273.
 Perrott, G. St. J., Tibbitts, C., and Britten, R. H. (1939). *U.S. publ. Hlth Rep.*, **54**, 1663.
 Richter, L. (1948). *Canad. J. publ. Hlth*, **39**, 1.
 Ryle, J. A. (1946). *Lancet*, **1**, 64.
 Sheldon, J. H. (1948). *The Social Medicine of Old Age*. Oxford University Press, London.
 Spring Rice, M. (1939). *Working-class Wives*. Penguin Series.
 Stevenson, A. C. (1947). *Bull. Hyg., Lond.*, **22**, 489.
 Stocks, P. (1944). *Proc. R. Soc. Med.*, **37**, 593.
 — (1947). *Publ. Hlth, Lond.*, **60**, 137.
 Sydenstricker, E. (1926). *U.S. publ. Hlth Rep.*, **41**, 2069.
 Walker, J. V. (1947). *Med. Offr.*, **78**, 169.

EPILEPSY AND TETANY

BY

J. E. G. PEARSON, D.M., M.R.C.P.

Late Wing Commander, R.A.F.V.R.

The following case report shows that the true significance of an attack of "symptomatic" epilepsy may long remain latent.

Case Report

A flight lieutenant in the R.A.F. aged 24 was admitted to an R.A.F. hospital on July 11, 1947, with a story from his medical officer that a batwoman who had gone to remove his supper tray had found him in bed in a semiconscious state, and when she approached him he made as though to strangle her; for this reason he was put in charge of the neuropsychiatrist.

On questioning, he denied any memory of this attack, after which he felt weak but not confused, nor did he complain of headache. For three days previously he had complained of some malaise, nausea, anorexia, and later vomiting, followed by the most striking symptom at this stage—hiccup. He had not bitten his tongue or been incontinent in this attack, but he gave a history of a similar chain of events two years previously while overseas, ending in an attack in which he bit his tongue. On account of that epileptiform event he had been invalided home. During the intervening period he claimed to have had perfectly normal health and had taken no medicine or tablets.

His past history showed nothing to suggest petit mal, and he had not suffered from fainting attacks or headaches. He had never sustained a head injury. He had had diphtheria and pneumonia as an infant, and his appendix had been removed for an acute attack without complications three months before admission.

Examination showed a well-built man with no evidence of loss of weight. There was some dryness of the mouth (to which he attributed his slight dysarthria), with a healed scar on his tongue. Mentally he seemed rather apathetic and slightly drowsy, and was hiccupping 20 to 30 times a minute. Blood pressure was 120/80. No other abnormal physical signs were found in any system on clinical examination.

During his first three days in hospital numerous measures were tried to control his hiccup, which persisted even during sleep, but no treatment had any prolonged effect. He was encouraged to eat what he could manage of light diet and to take plenty of fluids, as the vomiting had ceased since admission.

On July 14 he was still a little drowsy and dry in the mouth. His blood urea was 85 mg. per 100 ml., blood sugar 130 mg. per 100 ml., and his urine contained a cloud of albumin. A general