Measurement of morbidity / a report of the Statistics Sub-Committee of the Registrar General's Advisory Committee on Medical Nomenclature and Statistics.

Contributors

Great Britain. General Register Office. Advisory Committee on Medical Nomenclature and Statistics. Statistics Sub-Committee.

Publication/Creation

London : H.M.S.O., 1954.

Persistent URL

https://wellcomecollection.org/works/vpry6s49

License and attribution

This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.

wellcome collection

Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
https://wellcomecollection.org

WELLCOME INSTITUTE LIBRARY
N 52
pam
WA950
1954
G78m

15682
THE ROYAL SANITARY INSTITUTE LIBRARY

GENERAL REGISTER OFFICE

STUDIES ON
MEDICAL AND POPULATION
SUBJECTS

No. 8

Measurement of Morbidity

A REPORT OF THE
STATISTICS SUB-COMMITTEE OF THE
REGISTRAR GENERAL'S ADVISORY COMMITTEE
ON MEDICAL NOMENCLATURE
AND STATISTICS

LONDON:
HER MAJESTY'S STATIONERY OFFICE
1954

PRICE 1s. 6d. NET

N/52

The Registrar General's Returns of Births, Deaths and Marriages are published Weekly and Quarterly and contain valuable statistical information under the following headings.

England and Wales

WEEKLY

Births and deaths in great towns, distinguishing deaths from certain notifiable diseases: infectious diseases in all local areas.

Price 1s. per copy (1s. 1½d. by post). **Annual subscription £2 18s. 6d.** (including postage).

QUARTERLY

Estimates of national population (by sex, age, marital condition and Standard Regions): population of, and births, marriages and deaths registered in, each geographical county: population of, and births and deaths (including deaths of children under one year of age) registered in, 160 great towns and 160 smaller towns: vital statistics of certain foreign countries and great towns: summaries of corrected notifications of infectious diseases: meteorological report: other vital statistics.

Price 2s. per copy (2s. 1½d. by post). **Annual subscription 8s. 6d.** (including postage).

Scotland*

Annual subscription	**Weekly**	**17s. 4d.**
(including postage)	**Quarterly**	**10s. 6d.**

* Orders for these should be sent to the Edinburgh Sale Office.

Obtainable from

HER MAJESTY'S STATIONERY OFFICE

at the addresses shown on page four of the cover,

or through any bookseller.

22501995080

GENERAL REGISTER OFFICE

STUDIES ON MEDICAL AND POPULATION SUBJECTS

No. 8

Measurement of Morbidity

A REPORT OF THE
STATISTICS SUB-COMMITTEE OF THE
REGISTRAR GENERAL'S ADVISORY COMMITTEE
ON MEDICAL NOMENCLATURE
AND STATISTICS

THE ROYAL SANITARY INSTITUTE
LIBRARY

LONDON:
HER MAJESTY'S STATIONERY OFFICE
1954

ADVISORY COMMITTEE
ON MEDICAL NOMENCLATURE AND STATISTICS

Terms of Reference

To consider from the medical point of view and to advise upon questions affecting the International Statistical Classification of Diseases, Injuries and Causes of Death and any other matters concerning medical nomenclature or statistics which may from time to time be referred to the Committee.

Sir Ernest Rock Carling, M.B., B.S., F.R.C.S., F.R.C.P., F.F.R., LL.D. (Chairman).
E. W. Bedford-Turner, M.R.C.S., L.R.C.P.
J. Boyd, C.B.E., M.D., F.R.C.P.I.
S. Cieman, M.R.C.S., L.R.C.P.
Sir Allen Daley, M.D., F.R.C.P.
Sir Ernest F. Finch, M.D., M.S., F.R.C.S.
F. H. K. Green, C.B.E., M.D., F.R.C.P.
Professor F. Grundy, M.D., D.P.H.
C. F. Harris, M.D., F.R.C.P.
Professor A. Bradford Hill, C.B.E., D.Sc., Ph.D., F.R.S.
A. E. Joll.
Professor A. J. Lewis, M.D., F.R.C.P.
W. P. D. Logan, M.D., Ph.D.
E. K. Macdonald, O.B.E., M.D., D.P.H.
A. Massey, C.B.E., M.D., Q.H.P.
P. L. McKinlay, M.D., F.R.S. (Ed.).
Professor W. C. W. Nixon, M.D., F.R.C.S., F.R.C.O.G.
W. N. Pickles, M.D., M.R.C.P.
Professor R. Platt, M.D., F.R.C.P.
A. H. T. Robb-Smith, M.D., M.R.C.P.
P. Stocks, C.M.G., M.D., F.R.C.P.
Professor R. E. Tunbridge, O.B.E., M.D., F.R.C.P.
Miss A. L. Winner, O.B.E., B.Sc., M.D., M.R.C.P.
R. M. Blaikley, G. Price-Jones } Joint Secretaries.

Statistics Sub-Committee

Professor A. Bradford Hill, C.B.E., D.Sc., Ph.D., F.R.S. (Chairman).
N. T. J. Bailey, M.A.
E. A. Cheeseman, B.Sc., Ph.D.
J. Knowelden, M.D., D.P.H.
M. B. Knowles, C.B.E., F.I.A. (until 31.12.52).
W. P. D. Logan, M.D., Ph.D.
P. L. McKinlay, M.D., F.R.S. (Ed.).
Miss Vera Norris, M.B., Ch.B., Ph.D.
Mrs. Lilli Stein, M.A., Ph.D.
R. M. Blaikley (Secretary).

The following also attended meetings of the Sub-Committee in relation to special aspects:—

Miss E. M. Brooke, M.Sc.
W. D. T. Brunyate, D.M., D.P.H.
C. J. Donelan, M.B., D.P.H.
R. E. Ford, M.D., M.R.C.P.
J. H. Gunlake, C.B.E., F.I.A.
D. G. MacKay, M.A., M.B., Ch.B.

WELLCOME INSTITUTE LIBRARY
Coll. welMOmec
Call No. pam WA950 1954 G78m

The statistical appraisal of sickness is receiving increasing attention in this and other countries but there has been some lack of agreement about the appropriate measurements to apply and the appropriate way of describing them.

With a view to fostering more general agreement on these essential matters my Medical Advisory Committee entrusted to its Statistics Sub-Committee, under the Chairmanship of Professor Bradford Hill, the task of attempting to formulate suitable definitions in the light of available material and opinions.

This first Report by the Sub-Committee has now come to me with the recommendation of the main Committee that it should be published in order to encourage the experimental use of the definitions proposed in it, to stimulate wider discussion of the subject and to provoke constructive criticism.

We are proposing for our part to try out experimentally in our future publications the various definitions framed by the Sub-Committee.

As pointed out in the Report there are some aspects of measurement of morbidity which have been deliberately excluded, and it is fully recognized that there may well be needs which have not yet been satisfactorily met. It is permissible to hope, however, that the production of the Report and the experiments and discussions to which it leads may constitute at least a step forward towards a standard usage which could be adopted for both national and international purposes and so contribute towards the building up of new knowledge and, ultimately, the saving of life and health.

A copy of the Report has been sent to the World Health Organization, whose active interest in the subject is indicated in paragraph 1.

GEORGE NORTH,
Registrar General.

General Register Office,
Somerset House.

August, 1954.

A. INTRODUCTION

1. The Sub-Committee was appointed at the instance of the Advisory Committee, which referred to them a request of the World Health Organization's Expert Committee on Health Statistics that certain countries, including the United Kingdom, be asked to make preliminary reports on methods of measuring morbidity and on the terms by which morbidity rates and indices should be described. The Sub-Committee held their first meeting in July, 1952 and have held 11 meetings on this subject.

2. The present report is concerned with measurements relating primarily to events happening in limited periods of observation. It is not intended to cover all aspects of morbidity measurement and the Sub-Committee may wish, at a later date, to submit a further report, notably in relation to statistics derived from " longitudinal " studies which are concerned primarily with the long-term history of individuals rather than the " cross-section " of morbidity displayed in a limited period.

3. Morbidity statistics must take account of several factors which do not affect mortality statistics. Death is a clearly defined event; the very definition of sickness is confused by the facts that its development and recession may be gradual, its severity may vary and its manifestations may be related to subjective reactions. Death occurs at a definite point of time; sickness may last over periods of varying lengths. Death can happen only once to each person; the same person may suffer sickness several times during his life. Assuming that the problem of defining sickness can be overcome, morbidity statistics must provide for measurement of duration of sickness and must distinguish between the frequency of sickness incidents and the number of persons affected by them. Partly because of these characteristics of morbidity and partly because of the different sources of information and the different purposes for which morbidity information might be used, there are many concepts of what constitutes sickness which must be taken into account.

4. There are many ways in which data about morbidity can be aggregated and related to other data; it has been necessary to select those ways which would appear to be most useful in practice. It is hoped, however, that the framework of rates set out in Section B of this Report will meet most general needs directly and at the same time provide a basis which is sufficiently flexible to be extended to meet particular needs which may arise.

5. The value of any measurements relating to morbidity statistics is obviously dependent on the completeness or representativeness of the source of information from which they are derived. While it is not the object of this Report to consider the value of particular sources of morbidity statistics for different purposes, it is necessary to point out that the inclusion, amongst the subsequent definitions, of rates derived from restricted sources of information does not imply that those rates will be useful where the source is itself biassed, or otherwise unsatisfactory, in relation to the use which it is proposed to make of it. Some of the limitations in the use of the proposed rates are indicated in Section C of this Report.

6. In defini ng rates the Sub-Committee have adopted the " spell " of sickness and the sick person as alternative basic units because they are the units which, usually, are counted most easily. It is recognized that the " spell " of sickness will not always be the best unit of measurement, particularly for long-term diseases; but the definitions of rates relating to spells can be adapted to other

units when the necessary information is available. In a similar way they can be adapted when the " spell " of sickness cannot be readily derived from the records, for example by counting medical consultations in place of " spells " in general practitioners' records.

7. In Section B.I and II the definitions of certain terms are considered and some general notes about using the proposed rates are set out. In Section B.III to VI rates are defined in general terms, a short title for each rate is proposed, and attention drawn to certain points which should be borne in mind in using the rates. In relation to particular sources of information, the general definitions, notably the words in italics, should be replaced by more precise terms appropriate to the particular source; in some circumstances an alternative short description of the rate may be desirable. Examples of the ways in which the rates can be adapted to the sources of information specially considered by the Committee are included in Section C of this Report.

8. In defining rates, the Sub-Committee does not wish to imply that rates are the only or, indeed, in some circumstances even a good way of measuring morbidity. In addition, the actual numbers on which rates are based are fundamental and should normally be given and, for some purposes, full frequency distributions of the observed occurrences are more useful than rates or averages.

9. In submitting this Report the Sub-Committee wishes to record how much it owes to the patience and skill of its Secretary, Mr. R. M. Blaikley.

B. DEFINITIONS

I. Definitions of Terms

(1) The terms "**sickness**" and "**sick**" (including effects of accident or other violence) have been used in the definitions of rates as general terms and no attempt has been made to define them precisely. Their meaning is likely to vary according to the objects of a particular enquiry and the sources of information available. The words are inserted in italics in the definitions to indicate that more precise terms appropriate to particular enquiries should be substituted for them.

Thus, for example, the words "spell *of sickness*" may be replaced by:—
spell of sickness absence, or
spell of in-patient care
and the words "who *are sick*" by:—
who are absent sick,
who consult their general practitioners,
who attend out-patient departments, or
who receive in-patient care.

(2) The term "**case**" *of sickness* is not defined because it is impracticable to give a definition which would be appropriate to all diseases. The general intention is that it should cover the whole course of one disease in one person as far as that course is relevant to the particular enquiry concerned.

(3) The term "**disease**" has been used in the report to include sickness arising from accident or other violence.

(4) A "**spell**" *of sickness* is a period during which a person is *sick* on one day (or shift) or on each of a consecutive series of days (or shifts).

Examples are:—
a spell of sickness absence, or
a spell of in-patient care.

(5) The "**duration**" of a spell *of sickness* normally includes each of the consecutive series of days for which *sickness* is recorded. In measuring the duration of a spell of in-patient care, the day on which the patient is discharged should not be counted as well as the day on which he was admitted.

(6) The "**number of persons exposed to risk**" at a given time should include all those persons who would, in the event of their becoming *sick*, be recorded as *sick* in the context of the particular enquiry; it should exclude any others.

(7) The "**total duration of exposure to risk**" is the duration in days (or other time units) of the defined period of observation multiplied by the average number of persons exposed to risk per day (or other time unit) during that period.

(8) The term "**incidence**" has been avoided in the actual definitions and descriptions of rates, because, although it is often used in the sense of sickness "beginning", it is frequently used also without this restricted connotation. The Sub-Committee therefore decided that current usage of the word is too broad to permit its adoption in the specific sense for which the word "inception" has been adopted in this Report.

II. General Notes

(1) Rates as defined may be applied to all causes of sickness, but may equally well be applied to particular causes of sickness and for many purposes will need to be so applied.

(2) Rates as defined may be applied to whole populations or to subdivisions of these populations according to sex, age, occupation, place of residence, etc.

(3) Rates are defined to give figures per unit, but they may, if so wished, be expressed per cent, per thousand, etc.

(4) A short description should never be used without suitable reference to the full definition. The word " spells " or " persons " should be omitted from the short description only when the context makes the meaning obvious.

III. Rates relating to Inception

1. Rate of Inception of spells *of sickness*

" The number of **spells** *of sickness* which **start** during a defined period divided by the average number of persons exposed to risk during that period."

Short title:—" Inception rate (spells)."

NOTES:

(a) Several " spells " begun by any one person during the defined period of observation must each be counted separately.

(b) The relevant " spells " in the numerator comprise only:—
(i) Spells beginning and ending in the period,
(ii) Spells beginning in the period and still continuing at the end of the period.

(c) If some " spells " relate to more than one disease (i.e. concurrent or consecutive diseases within the same spell) and if, in using the rates in relation to individual diseases, such spells are counted for each of the diseases separately, then the rates for individual diseases cannot be aggregated to give the equivalent rate for all diseases combined.

(d) When first " spells " due to a particular disease can be distinguished from subsequent " spells " for the same disease, this definition may be adapted to relate to the first " spells " only.

(e) In many studies of morbidity the full frequency distribution, showing numbers of persons who begin different numbers of spells, will be required; such information is valuable in studying variations in people's individual tendency towards repeated sickness.

(f) It may sometimes be easier to derive a **rate of termination** of spells from the available records instead of a **rate of inception.** The uses of such a rate would be similar and, when the duration of sickness is short in relation to the period of observation, the two rates would, in effect, be interchangeable.

2. Proportion of persons who start a spell *of sickness* during a period

" The number of **persons** who **start** at least one spell *of sickness* during a defined period divided by the average number of persons exposed to risk during that period."

Short title :—" Inception rate (persons)."

NOTES:

(a) Persons who begin more than one " spell " during the period of observation must be counted **once** only.

(b) The relevant persons in the numerator comprise only those with:—
(i) Spells beginning and ending in the period,
(ii) Spells beginning in the period and still continuing at the end of the period.

(c) If some persons are sick from more than one disease (i.e. at the same time or on successive occasions within the period of observation) and if, in using

the rate in relation to individual diseases, such persons are counted for each of the diseases separately, then the rates for individual diseases cannot be aggregated to give the equivalent rate for all diseases combined.

IV. Rates relating to Prevalence

3 (A). Rate of Prevalence of spells *of sickness* in a period

" The number of **spells** *of sickness* which are **current at some time** during a defined period divided by the average number of persons exposed to risk during that period."

Short title :—" Period Prevalence rate (spells)."

NOTES:

(a) Several " spells " experienced by any one person during the defined period of observation must each be counted separately.

(b) The relevant " spells " in the numerator comprise:—

(i) Spells beginning and ending in the period,

(ii) Spells beginning in the period and still continuing at the end of the period,

(iii) Spells beginning before and ending in the period,

(iv) Spells beginning before the period and still continuing at the end of the period.

(c) If some " spells " relate to more than one disease (i.e. concurrent or consecutive diseases within the same spell) and if, in using the rate in relation to individual diseases, such spells are counted for each of the diseases separately, then the rates for individual diseases cannot be aggregated to give the equivalent rate for all diseases combined.

(d) In many studies of morbidity the full frequency distribution, showing numbers of persons who experience different numbers of spells, will be required; such information is valuable in studying variations in people's individual tendency towards repeated sickness.

3 (B). Rate of Prevalence of spells *of sickness* at a point of time

" The number of **spells** *of sickness* which are current **at a given time** divided by the number of persons exposed to risk at that time."

Short title:—" Point Prevalence rate."

NOTES:

(a) The rate will be numerically the same as rate 4 (B) below.

(b) The number of spells may be based on an actual count at a specific point of time or may be an average calculated for a specific point of time.

(c) If some " spells " relate to more than one disease current at the given time and if, in using the rate in relation to individual diseases, such spells are counted for each of the diseases separately, then the rates for individual diseases cannot be aggregated to give the equivalent rate for all diseases combined.

4 (A). Proportion of persons *sick* in a period

" The number of **persons** who *are sick* **sometime** during a defined period divided by the average number of persons exposed to risk during that period."

Short title:—" Period Prevalence rate (persons)."

NOTES:

(a) The complement of this rate may be useful, i.e. the proportion of persons who were never sick during the period.

(b) Persons who experience more than one "spell" during the period of observation must be counted **once** only.

(c) The relevant persons in the numerator comprise those with:—

(i) Spells beginning and ending in the period,

(ii) Spells beginning in the period and still continuing at the end of the period,

(iii) Spells beginning before and ending in the period,

(iv) Spells beginning before the period and still continuing at the end of the period.

(d) If some persons are sick from more than one disease (i.e. at the same time or on successive occasions within the period of observation) and if, in using the rate in relation to individual diseases, such persons are counted for each of the diseases separately, then the rates for individual diseases cannot be aggregated to give the equivalent rate for all diseases combined.

4 (B). Proportion of persons *sick* at a point of time

"The number of **persons** who *are sick* at a **given time** divided by the number of persons exposed to risk at that time."

Short title:—"Point Prevalence rate."

NOTES:

(a) The rate will be numerically the same as rate 3 (B) above.

(b) The number of persons may be based on an actual count at a specific point of time or may be an average calculated for a specific point of time.

(c) If some persons are sick from more than one disease at the given time and if, in using the rate in relation to individual diseases, such persons are counted for each of the diseases separately, then the rates for individual diseases cannot be aggregated to give the equivalent rate for all diseases combined.

V. *Measures relating to Duration

5. The average Duration *of sickness* per completed spell

"The total of the **entire durations** of all spells *of sickness* **ending** during a defined period divided by the number of **spells ending** during that period."

Short title:—"Average duration per spell."

NOTES:

(a) The relevant spells in the numerator comprise the **whole** of those spells of sickness which end in the period of observation and may thus include days of sickness prior to the period.

(b) If rates are used in relation to individual diseases, the duration of a spell of sickness which relates to more than one disease should, in calculating rates for each of the diseases separately, either be assigned wholly to one of the diseases or be apportioned between the diseases concerned on some basis relevant to the object of the enquiry.

(c) The average duration per spell may be misleading and the full frequency distribution, showing the numbers of spells of different durations, will often be required.

6. The average Duration *of sickness* per *sick* person

"The total of the **entire durations** of all spells *of sickness* **ending** during a defined

* In other parts of the Report, the measures defined in this section have, for convenience, been referred to as rates.

period divided by the number of **persons** who experienced at least one **spell ending** during that period."

Short title:—" Average duration per *sick* person."

NOTES:

(a) The relevant durations in the numerator comprise the **whole** of those spells of sickness which **end** in the period of observation and may thus include days of sickness prior to the period.

(b) The denominator comprises only those persons who experience at least one spell of sickness included in the numerator; persons who experience more than one such spell must be counted once only.

(c) If rates are used in relation to individual diseases, the duration of a spell of sickness which relates to more than one disease should, in calculating rates for each of the diseases separately, either be assigned wholly to one of the diseases or be apportioned between the diseases concerned on some basis relevant to the object of the enquiry.

(d) The average duration per sick person may be misleading and the full frequency distribution, showing the numbers of people who experience different durations of sickness, will often be required.

7. The average Duration *of sickness* per person

" The total **duration** within a defined period of all spells *of sickness* that occurred **wholly or partly within** that period divided by the average number of **persons** exposed to risk during the period."

Short title:—" Average duration per person."

NOTES:

(a) The relevant durations in the numerator comprise only those days of sickness which fall within the period of observation.

(b) If rates are used in relation to individual diseases, the duration of a spell of sickness which relates to more than one disease should, in calculating rates for each of the diseases separately, either be assigned wholly to one of the diseases or be apportioned between the diseases concerned on some basis relevant to the object of the enquiry. Rates so calculated may then be aggregated to give the equivalent rates for all diseases combined.

(c) The average duration per person may be misleading and the full frequency distribution, showing the numbers of people who experience different durations of sickness, will often be required.

8. The proportion of time *sick*

" The total **duration** within a defined period of all spells *of sickness* that occurred **wholly or partly within** that period divided by the total duration of exposure to risk in the period."

Short title:—" Proportion of time lost."

NOTES:

(a) Such a rate is likely to be most useful in relation to sickness absence.

(b) The relevant durations in the numerator include only those days of sickness which fall **within** the period of observation.

(c) If rates are used in relation to individual diseases, the duration of a spell of sickness which relates to more than one disease should, in calculating rates for each of the diseases separately, either be assigned wholly to one of the diseases or be apportioned between the diseases concerned on some basis relevant to the object of the enquiry. Rates so calculated may then be aggregated to give the equivalent rates for all diseases combined.

VI. Rates relating to Fatality

9. Fatality Ratio

" The number of **deaths** from a disease recorded during a defined period divided by the number of **new cases** of that disease recorded during the same period (or related period)."

Short title:—" Fatality ratio."

NOTE:

This rate provides a reasonable measure of the fatality risk only when the normal duration of a disease is short in relation to the period of observation. The accuracy of the rate may be improved by relating deaths in the defined period to cases arising in an earlier period determined by the normal interval between inception of sickness and death. When these conditions do not apply, the fatality risk can be adequately measured only by follow-up methods.

C. USE OF THE RATES PROPOSED

The rates proposed in Section B are expressed in general terms which can readily be adapted to fit particular sources of information. In applying the rates to different sources of information it will be necessary to take account of the purposes to which that information is suited and of the units which are normally recorded in relation to that source. To meet such points the definitions of rates may need slight modification. In relation to some sources of information short titles different from those suggested in Section B may be more appropriate, but no short title should be used if it might be confused with those suggested.

For most, if not all, purposes rates applied to particular causes of sickness will be most valuable and for some purposes they will be essential.

The Sub-Committee considered these points in relation to the following sources of information:—

General Surveys of Sickness.
Records of Sickness Absence.
General Practitioners' Records.
Notifications of Disease.
Hospital In-patient Records.
Hospital Out-patient Records.

There are other sources of morbidity information of a special or routine character, e.g. school medical records and health visitors' records which do not appear to present any different basic problems.

General Surveys of Sickness

The Sub-Committee considered surveys in which information is collected directly from the persons, or a sample of the persons, constituting the population at risk; this may or may not be supplemented by information obtained from other sources. The Sub-Committee had particularly in mind surveys designed to collect information about all forms of sickness experienced by the general population, as in the Survey of Sickness undertaken by the Ministry of Health and the General Register Office from 1944 to 1952; but the survey method may also be used to collect information about specific problems relating to particular diseases in particular population groups.

The main uses of the general survey are to obtain as complete a picture as possible of morbidity in a given period and to indicate the extent to which other sources, e.g. absence records, general practitioners' records or hospital records, fall short of providing a complete picture. These uses of the survey method may, however, be limited by the degree of confidence which can be attached to the diagnoses reported by the persons interviewed and by subjective factors which may influence their reporting. It is, nevertheless, possible to collect information in a general survey which would provide the data for calculating any of the rates defined in this Report. The ways in which these rates can be used are discussed in the following paragraphs relating to other sources of information.

Records of Sickness Absence

The main use of morbidity information derived from sickness absence records would appear to lie in the investigation of wastage through sickness in loss of manpower or loss of school time and, where sickness benefit is payable, the cost of providing benefits.

The overall wastage can be expressed by a point prevalence rate of sickness

absence (rates 3 (B) and 4 (B)), the average duration of sickness absence per person (rate 7) or the proportion of time lost (rate 8). (If the point prevalence rate is expressed as an average over the period of observation, then rates 3 (B), 4 (B) and (8) are numerically equal, while rate (7) is a multiple of the others by the number of days (or other time units) in the period of observation.)

The overall wastage may be considered as being the resultant of three main components each of which may be examined in relation to possible ways of reducing wastage and to variations in total wastage. These are:—the proportion of persons affected by sickness, for which an inception rate (persons) (rate 2) would be appropriate; the frequency with which they are affected, for which an inception rate (spells) (rate 1) and a frequency distribution of spells per person would be appropriate; and the period for which they are affected, for which an average duration per spell (rate 5), a frequency distribution of durations per spell, an average duration per person (rate 7), an average duration per sick person (rate 6) and a frequency distribution of durations per person would all be relevant.

The above rates may be used in relation to all diseases and total populations at risk or in relation to individual diseases and to different sections of the populations at risk.

Records of sickness absence may also be useful, subject to certain limitations, in the determination of the distribution of diseases and to indicate action which might prevent sickness. Their main limitations are the reliability of statements of diagnosis on absence records and the subjective factors which may influence attendance at work. For this purpose an inception rate (persons) (rate 2) is probably the most useful unless an inception rate (**first** spells) can be derived from the records; a normal inception rate (spells) can be used only for those causes of sickness which do not usually produce more than one spell of sickness for each case.

General Practitioners' Records

For individual practices, or small groups of practices, there may be serious difficulties in determining populations at risk for calculation of rates, unless, either a complete list of patients who would normally attend each practice is maintained (as under the National Health Service in the United Kingdom), or an isolated area is served entirely by the individual practice or group concerned. Where the populations at risk can be determined, general practitioners' records are likely to be among the most useful sources of information in estimating the incidence of many causes of sickness; they cannot by themselves indicate the full incidence of causes of sickness which do not always require medical attention.

It is not normally easy to define or measure a spell of sickness or duration of sickness on the basis of general practitioners' records. The units which are simplest to count on a routine basis are sick persons and **consultations** between general practitioners and patients, which may be defined as occurring on

> " each occasion when a patient attends for medical treatment or advice at the general practitioner's surgery, whether during general surgery hours or by appointment, or when the general practitioner visits the patient to give treatment or advice elsewhere, other than in hospital ".

Two rates can readily be deduced—a prevalence rate (persons) following the normal pattern (rate 4 (A)), and a **consultation rate,** which may be defined as follows:—

> " The number of **consultations** between general practitioners and their patients during a defined period divided by the average number of persons exposed to risk during that period."

The main use of routine morbidity information derived from general practitioners' records is to help in determining the distribution of disease and to indicate action which might prevent sickness. For this purpose the use of a

first consultation rate would be the most appropriate rate, but a prevalence rate (persons) (rate 4 (A)) may be used in relation to causes of sickness which would not normally attack the same person more than once during the period of observation.

The actual number of consultations may give a crude indication of the volume of work falling on general practitioners, but, for investigating variations in the volume of work, the rate of consultations, the prevalence rate (persons) (rate 4 (A)) and the frequency distribution of consultations per person will be relevant as well as sub-divisions of these measurements by causes of sickness and different sections of the populations at risk.

General practitioners' records are likely to be useful in assessing efficacy of treatment only on the basis of carefully planned follow-up studies relating to particular diseases; rates relevant to such studies are not considered in the present Report.

Notifications of Disease

Notification of a case of disease normally occurs at an early stage in the case, but no information about the duration of sickness is normally collected. Among the rates considered in this Report the only ones which are applicable are inception rates, to which the notification rate is an equivalent, and the fatality ratio (rate 9). The **notification rate** should be defined as:—

> " The number of **notifications** during a defined period divided by the average number of persons exposed to risk during that period."

This rate may be qualified as " Notification rate (corrected) " or " Notification rate (uncorrected) " according to whether the original notifications have or have not been amended for revisions of diagnoses. The rate may be applied to an ad hoc system of notification for a special survey as well as to the statutory notification system.

For diseases where notification is known to be practically complete, the notification rate will be helpful in determining the distribution of the disease and in indicating action which may be appropriate for its prevention. Where notification is known to be incomplete, the notification rate may still be useful for these purposes, provided that account is taken of the possibility that completeness of notification may vary between different groups of the population.

The notification rate may also provide a rough indication of resources needed for treatment of diseases which are notifiable.

For diseases of short duration in relation to the period of observation, the fatality ratio (rate 9) may be sufficiently accurate to indicate substantial changes in the severity of the disease or in the efficacy of treatment.

Hospital Records

The main use of hospital morbidity statistics is for investigating the provision and use of hospital services. Rates calculated separately for the different specialties within hospitals may often be needed. Rates should be supplemented by information about waiting lists where possible. For individual hospitals, or small groups of hospitals, there may be serious difficulties in determining populations at risk for the calculation of rates. Absolute variations in the amount of services provided may be indicated by the actual numbers of cases admitted, or discharged, during a defined period, or by the actual numbers receiving treatment at particular dates; but comparisons of the services provided to different sections of the population require the use of rates. In some areas it may be reasonable to assume that the whole population of the area is at risk for treatment in hospitals within the area, e.g. where the area is reasonably self-contained from the point of view of hospital services.

(a) In-patient records

The term " admission rate " will normally be used in relation to hospital in-patient statistics in place of " inception rate ", but a rate of termination of spells of hospital care or a " discharge rate " may sometimes be more conveniently derived from the records. If the period of observation is long in relation to the average duration of a spell, the " admission rate " and the " discharge rate " are to a large extent interchangeable and the question of which will be used in particular circumstances is primarily a matter of convenience.

The point prevalence rate (rate 3 (B) or 4 (B)) provides an indication of the total service provided by hospitals at particular dates or averaged over a period. The admission or discharge rate (spells) (rate 1) and the average duration per spell (rate 5) indicate two components of the total service which may be investigated independently; the admission rate (persons) (rate 2), average duration per person (rate 7) and average duration per sick person (rate 6), and the corresponding frequency distributions, provide alternative measures from a slightly different point of view. These measures may be used in relation to all diseases and total populations at risk, but will frequently be more illuminating if used in relation to individual diseases and different sections of the populations at risk.

The scope for investigating the distribution of diseases on the basis of routine hospital in-patient statistics is restricted to such diseases as normally require admission to hospital at some stage. For diseases where, in addition, not more than one spell of in-patient care is normal, the admission rate, or discharge rate, (spells) (rate 1) would be relevant, but a rate limited to first admissions could be used over a wider field. In the absence of a first admission rate, an admission rate (persons) may provide a reasonable alternative.

Changes in a fatality ratio (rate 9) may provide some indication in changes in efficacy of treatment for diseases of short duration, but, unless patients can be followed up after discharge, its use for this purpose is likely to be very restricted. Average duration per spell may also provide some indication of efficacy of treatment, but it is likely to be influenced by many other factors; average duration per sick person (rate 6) (i.e. covering all spells relating to the same person) would be more useful, though still subject to influence by other factors.

(b) Out-patient records

A spell of sickness cannot normally be measured on the basis of out-patient records and attendance at an out-patient department for treatment or advice is the usual unit recorded; persons attending may also be suitably recorded. Two rates can readily be deduced from such records—a prevalence rate (persons), following the normal pattern (rate 4 (A)), and an **out-patient attendance rate,** which may be defined as follows:—

> " The number of **out-patient attendances** during a defined period divided by the average number of persons exposed to risk during that period."

The attendance rate and the prevalence rate (persons), as well as the corresponding frequency distributions, may be used in investigating variations in the use made of out-patient departments. Where possible rates should be calculated separately for old and new patients.

As a means to the investigation of the distribution of diseases, hospital out-patient statistics can do no more than supplement other sources of information, for which purpose an attendance rate (**first** visits) or a prevalence rate (persons) may be useful.

19*th June*, 1954.

Somerset House,
London, W.C.2.

Printed in Great Britain under the authority of Her Majesty's Stationery Office by The Whitefriars Press Ltd.
London and Tonbridge.

(77) Ps.406427 Wt. 3181/199 K12 11/54 W.P. Ltd. Gp. 587

STUDIES ON MEDICAL AND POPULATION SUBJECTS

A series of occasional publications designed to provide in convenient form a more extensive treatment of important subjects than is practicable within the limits of the Registrar General's Annual Statistical Review.

No. 1—Regional and Local Differences in Cancer Death Rates, by Percy Stocks, M.D., D.P.H. 1947. **1s.** (1s. 2d. by post)

No. 2—Sickness in the Population of England and Wales in 1944-1947, by Percy Stocks, C.M.G., M.D., F.R.C.P. 1949. **1s.** (1s. 2d. by post)

No. 3—Cancer Registration in England and Wales, by Percy Stocks, C.M.G., M.D., F.R.C.P. 1950. **2s.** (2s. 2d. by post)

Supplement to No. 3—Cancer Registration in England and Wales—Third year Recovery and Survival rates. 1952. **1s. 3d.** (1s. 4½d. by post)

No. 4—Hospital Morbidity Statistics—A preliminary study of In-patient Discharges, by Donald MacKay, M.A., M.B. 1951. **3s. 6d.** (3s. 8d. by post)

No. 5—Internal Migration—Some aspects of population movements within England and Wales, by Mary P. Newton, M.A., and James R. Jeffery. 1951. **1s. 6d.** (1s. 7½d. by post)

No. 6—External Migration—A study of the available statistics, 1815-1950, by N. H. Carrier, M.A., and J. R. Jeffery. 1953. **8s. 6d.** (8s. 11d. by post)

No. 7—General Practitioners' Records—An analysis of the clinical records of eight practices during the period April 1951 to March 1952, by W. P. D. Logan, M.D., Ph.D. 1953. **8s. 6d.** (8s. 9d. by post)

Obtainable from

HER MAJESTY'S STATIONERY OFFICE

at the addresses shown on page four of the cover,

or through any bookseller.

Crown Copyright Reserved

PUBLISHED BY HER MAJESTY'S STATIONERY OFFICE

To be purchased from

York House, Kingsway, LONDON, W.C.2 423 Oxford Street, LONDON, W.1

P.O. Box 569, LONDON, S.E.1

13a Castle Street, EDINBURGH, 2 1 St. Andrew's Crescent, CARDIFF

39 King Street, MANCHESTER, 2 Tower Lane, BRISTOL, 1

2 Edmund Street, BIRMINGHAM, 3 80 Chichester Street, BELFAST

or from any Bookseller

1954

Price 1s. 6d. net

S.O. Code No. 70-527-8