

## DATA ON SICKNESS ABSENCE IN SOME RECENT PUBLICATIONS OF THE MINISTRY OF PENSIONS AND NATIONAL INSURANCE

BY

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William Farr and many other pioneers advocated the systematic collection of data on incapacity from non-fatal disease. The National Insurance Act of 1946 provided for the compulsory insurance of everybody between school-leaving and retirement-pensionable age with the exception of married women, and also for payment of sickness benefit; this for the first time made possible the collection of national data on "sickness absence". Since 1950 the Annual Reports of the Ministry of Pensions and National Insurance (now the Ministry of Social Security) have given some information about sickness absence in this country (England, Wales, and Scotland); the most recent report (1965) gives figures for incapacity for work in 1963-4. Tabulations are provided for spells of incapacity; for spells commencing, spells current, and total days in the period; for males and females; by cause. This information has been amplified periodically by the "Digest of Statistics" (1958-61), which is available on request to research workers and others interested in public health (from the Statistics Division of the Ministry).

The "Digests" relate to a 5 per cent. sample of the insured population. The first dealt with the calendar year 1951; the latest, published in 1965, is for June, 1958, to May, 1961. The "Digests" contain data again on spells of incapacity derived from the claims for benefit; spells commencing in the period (by cause and age); spells of incapacity terminating in the period (by cause and duration); and number of claimants incapacitated on the last day of the period (by cause and age, and by duration and age). Based on the 1951 population-at-risk, age-standardized rates for 1953-4 onwards are provided for spells and for their duration. The "International Statistical Classification of Disease" List C, containing fifty

groups of Causes for Tabulation of Morbidity for Social Security Purposes is used, but components of groups are listed where numbers permit, so that figures are given, in all, for about 140 groups. The length of spells is not normally distributed (there is a tail of very long spells); the final certificate moreover is used for diagnosis of sickness, which has a disruptive effect due to change of diagnosis. The median, therefore, is provided as a better indication of change over the years than the mean. The introduction and notes comment on the trends in sickness incapacity, indicating the conditions in which changes are unlikely to be due to chance, but the "Digests" are a source of raw data rather than of interpretation and informed discussion.

The "Digests" provide a mass of data on current causes of sickness-absence, and on the trends over the years; they are thus of use in identifying conditions causing significant morbidity in the working community. The special "Report on the Inquiry into the Incidence of Incapacity for Work" is now published in two parts:

- I. The Scope and Characteristics of Employers' Sick Pay Schemes;
- II. The Incidence of Incapacity for Work in Different Areas and Occupations.

The present note is chiefly concerned with Part II.

The inquiry was the outcome of discussions between The Ministry of Pensions (MNPI), the Medical Research Council, and the Ministry of Labour. Its aim is to provide a picture of the extent and distribution of incapacity for work so as to identify occupations and local areas that might warrant further investigation. Previously published

routine statistics of *spells* and claims for sickness-benefit cannot be converted to rates of *persons* affected in different occupations because the number-at-risk of incapacity is obtained from a different source (the Census) where different job descriptions might be used by the respondents. Also the sampling error in bringing the two sets of data together will be large.

The existing machinery of the MPNI for collecting information about the 5 per cent. sample of insured persons was used in the special inquiry. Built on to this was an arrangement for asking the employers the actual occupation of all persons in the sample (and whether these individuals were also covered by an arrangement for receiving "sick pay" in addition to their National Insurance sickness-benefit). After an announcement by the Minister in Parliament, a circular letter was sent to 1,200 Employers Associations, Chambers of Commerce, and Personnel Officers of large firms describing the aim and scope of the inquiry. In response to this appeal occupational details were obtained for 97.6 per cent. of the men and 97.3 per cent. of the women in the sample, a remarkable achievement. The data from the employers thus provided the population-at-risk, by occupation and area of residence, and age was obtained from records at the Ministry's own central office in Newcastle. The sickness records were matched with the population data to produce:

- (i) Inception rates (*persons*) *i.e.*, the proportion of persons in every thousand who commenced one or more spells of incapacity from a given cause, and from all causes, in the period covered;
- (ii) The average days of incapacity (*spells*) experienced by each group of people including those with no incapacity. Spells lasting less than 4 days were ignored.

These data are a great advance on the routine data on *spells* of incapacity; the inception rate is for *persons* incapacitated, and is therefore unaffected by the number of spells per person.

## RESULTS

### INCAPACITY AND AREA

There were 620,457 men included in the sample and 28 per cent. of them recorded periods of incapacity for work lasting 4 days or more during the year. The area data has been grouped by the ten Standard Regions of England and Wales, plus Scotland; by Conurbations; by Town of population under 20,000, 20,000-49,999, 50,000-99,999 and over 100,000; and also by Rural Areas that were Semi-Industrial, Truly

Rural, or Intermediate. Rates of inception, and duration of absence, are given for all these "areas" for incapacity from all causes, and for 26 disease-groups selected by an Advisory Committee. Particular emphasis is laid upon bronchitis, arthritis and rheumatism, psychoses, and psychoneuroses. The proportion of men who became incapacitated for work in the year from "All Causes" was highest in Wales, followed by regions of England north and west of a line from the Humber to the Severn; it was lowest in regions south and east of a line from the Wash to the Isle of Wight. A similar relationship occurred for a wide range of disease groups. This confirms what might have been expected from mortality data.

### INCAPACITY AND OCCUPATION

Apart from any direct effect of occupation on health, incapacity rates in the current British situation may be influenced by several overlapping factors: the place of residence of the worker, including the influence of environment and availability of medical care; the multiple processes of selection of an individual "into" or "out" of a particular occupation, which are in part related to the physical or psychological demands of a job; the financial and social consequences of declared illness, including membership of a sick-pay scheme; the completeness of notification of incapacity (for example certain professional workers may not be required to produce certificates unless incapacity is prolonged); the general and particular unemployment situation; the morale within an industry and other little understood subcultural factors also surely play a part. Because of these confounding factors, it is not possible to say from the material in the Report that a high rate of incapacity means a definite occupational risk.

Both the inception rate and average days of incapacity for "All Causes" showed a marked inverse relationship with the degree of skill required by an occupation.

Table I (opposite) shows a gradient in inception rate for All Causes from the professional to the unskilled worker; the gradient is even more marked for persons incapacitated by bronchitis, arthritis, and rheumatism, or by psychoses and psychoneuroses. Similar results are obtained for duration of incapacity. The text discusses incapacity within the 25 Occupation Orders for the 26 selected causes of incapacity. As an example of the findings for inception rates, three occupations with very different sickness patterns are shown in Table II (opposite). The two physically active occupations both show relatively low rates for arteriosclerotic and degenerative heart

TABLE I  
AGE-STANDARDIZED INCEPTION RATES OF INCAPACITY  
AMONGST MEN IN DIFFERENT CLASSES OF OCCUPATION  
Persons Incapacitated per 100 Men at Risk

Class of Occupation	Cause of Incapacity			
	All Causes	Bronchitis	Arthritis and Rheumatism	Psychoses and Psycho-neuroses
Professional and Intermediate (I and II)	18	1.5	0.7	0.4
Skilled (III)	28	3.5	2.5	0.7
Partly Skilled (IV)	31	4.3	3.0	0.8
Unskilled (V)	35	5.7	4.0	1.3
All Occupations	28	3.7	2.5	0.7

TABLE II  
AGE-STANDARDIZED INCEPTION RATES OF INCAPACITY  
AMONGST MEN IN THREE DIFFERENT OCCUPATIONAL GROUPS  
All Men, Each Cause = 100

Diagnosis	Men Incapacitated per 100 at Risk		
	Agricultural Workers n.e.c.	Coal Miners; Face Workers	Professional and Technical Workers
Acute Upper Respiratory Infections	40	284	87
Influenza	60	234	80
Bronchitis	47	205	51
Chronic Sinusitis	55	300	97
Arteriosclerotic and Degenerative Heart Disease	33	61	100
Psychoses and Psycho-neuroses	45	196	64
Arthritis and Rheumatism	60	338	37
Gastroenteritis and Colitis	38	335	79
Eczema and Dermatitis	48	283	57
Peptic Ulcer	50	263	44
All Causes of Incapacity	67	188	75

n.e.c. = not elsewhere classified.

diseases; for other causes, physical and psychological, the miners have rates approximately four times that of agricultural workers. In contrast, professional workers show relatively high rates for arteriosclerotic and degenerative heart disease, low rates for arthritis and rheumatism, and intermediate rates for other conditions. Similar results are obtained in these occupational groups for duration of absence.

The data have also been analysed in an attempt to disentangle the separate effects of age, occupation, and area of residence on the average number of days of incapacity for work per man at risk. Nine occupational groups in six age groups were examined for the standard regions. For each of the groups the average number of days of incapacity per man increased with age (apart from slight occupational non-sig-

nificant fluctuation). When the analyses for each occupation were considered separately, the difference between the regions could in most cases be accounted for by sampling. Checks were made to see whether the differences in the rates found for each country or region could be attributed to the uneven distribution through Great Britain of occupations in which incapacity rates were high. It appears that this factor might account for about half the excess over the average in the Northern, and East and West Riding Regions, and for about a third of the excess in Wales. Conversely, the average number of days of absence of coal miners due to bronchitis varies from region to region, being well above average for the North Western, East and West Ridings, and Wales.

#### AIR POLLUTION\*

The data have been analysed in two parts, Greater London being dealt with separately from the remainder of Great Britain because more measuring sites were available in London at the time of the inquiry. For Great Britain, less London, amongst men aged 35 to 54 years, there was a significant correlation between bronchitis incapacity and both smoke and sulphur-dioxide content in high-density residential districts. South Wales, however, had far more bronchitis incapacity than could be accounted for by local pollution; the high proportion of coal miners is probably a factor. In Greater London there was a significant correlation between bronchitis incapacity and both forms of pollution. There was also, in both studies, more incapacity from arthritis and rheumatism in areas heavily polluted by smoke. This is a new and interesting finding; however, it was not possible to show if it was due to correlations with other variables.

#### DISCUSSION

The various reports emphasize that the results presented relate to certified incapacity for work, and that this is not synonymous with "sickness" in common medical usage. The comment on the "Digest of Statistics" also points out that doctors do not always record their diagnosis precisely and that they may refrain from entering the true diagnosis on the certificate. An attempt was made to check the accuracy of the diagnoses on the certificates of incapacity before and during the special inquiry. A sample of patients who had been referred to the Regional Medical Officers of the Ministry of Health

\* This chapter is contributed by Dr M. Clifton and Mrs M.-L. P. M. Weatherly of the Warren Springs Laboratory of the Department of Scientific and Industrial Research, who studied the data in relation to air pollution.

was studied, the R.M.O.'s diagnosis being compared with that of the general practitioner. The results of these tests are reported as showing a satisfactory level of accuracy in certification. However, the cases referred to the R.M.O. are not representative of all the incapacitated; persons with sickness of short duration are not normally referred even if the diagnosis of their condition is vague and unsubstantiated by investigation in hospital (yet such persons account for the major part of sickness absence). The R.M.O.'s decision is given only for the three broad diagnostic categories of "bronchitis", "arthritis and rheumatism", "psychoses and psychoneuroses", and the net effect of the R.M.O.'s opinion on the sample of patients is to increase the diagnoses ascribed to arthritis and rheumatism by 4 per cent. of the original total and to decrease the number of cases classed as bronchitis by 0.8 per cent. and as psychoses and psychoneuroses by 6 per cent. The comment in the latest "Digest" states that some of the more frightening (or less creditable) diseases are probably grossly understated in the statistics. According to the "Digest" there were 3,540 spells due to malignant disease amongst men in the year ending mid-1961; in 1961 about 24,000 males aged 15 to 64 years died from malignant neoplasms, equivalent to seven deaths for every spell of sickness. This indicates the extent to which the morbidity from such disease must be understated; many men with malignant disease must be certified as suffering from other conditions, and the brunt of this false certification must fall on other categories of chronic disease.

The analysis of the results also provides further evidence on the accuracy of the data. Thus, areas with high inception rates for psychoses and psychoneuroses had high inception rates also for nervousness, debility and headache, and migraine. There was no evidence that different rates for psychoses between areas could be due to differences among the doctors in these areas in their certification. Appendicitis showed no significant difference in inception rates in the eleven regions of Great Britain; this is stated to be a result one would expect if certification was not misleading, though Lee (1957) showed regional differences in the rate for appendicectomy and mortality from appendicitis, whilst the "Report of the Hospital In-patient Inquiry for 1961" (Ministry of Health, 1964) showed regional differences in discharge from hospital following appendicitis. The accuracy of the data depends on the co-operation of doctors who complete the certificates, and although the British Medical Association was asked to publicize the need for accuracy at the time of the Special

Inquiry, there is no evidence in the reports of any feedback that will bring home to the doctors the need for this.

The overall impression from reading these reports is that of a wealth of data and a dearth of comment about either its meaning or the use to which it should be put. The technical comments on the accuracy of certificates, the differences between sickness and incapacity, the need for age-standardized rates, and the attempt to partition the relative effects of age, occupation, area of residence, and sick-pay schemes are most helpful, but there is little or no interpretation of the results in the light of these comments; in fact, the last chapter of the report is missing. The aim of the special inquiry was to high-light atypical rates of incapacity for further more detailed study; there is, however, no summary of conclusions reached and no discussion of future plans. Perhaps the reviewer is wrong in believing interpretation of the data to be a function of the Ministry; should their duty be merely to produce data in a readily and quickly accessible form, leaving interpretation to independent workers in this field? A regular commentary on the data from the Ministry, with interpretation of trends, and regional or occupational differences, would surely be welcome; if produced as a separate report it need not delay publication of the raw statistics.

Lip service is often paid to the value of morbidity statistics in planning health services and how they would indicate possibilities for primary prevention of disease: no reference is made in these reports to the use that is currently made of these statistics. The statistics have obviously been of use to epidemiologists and other research workers even before the war (Morris, 1964), but there is no reference to recent studies, such as those of Lawrence and Aitken-Swan (1952), Hill, Doll, Galloway, and Hughes (1958), and Higgins, Cochrane, Gilson, and Wood (1959), which have in any way used the routine statistics; this suggests a lack of communication between interested parties.

The change in the overall sickness absence rates since the records became established are surely worthy of comment and interpretation (Morris, 1964, 1965). The trends in the absence by cause shown in the "Digests" are even more interesting, but they provoke no more than the remark that the rise in incapacity from arteriosclerotic and degenerative heart disease is not likely to be attributable solely to sampling effects, to type of spell classified to this heading, or to a rising proportion of old men in the insured population. The benefit of the control of certain infections is clearly demonstrated in the

figures; in contrast the rise in psychoneuroses and psychoses, migraine, nervous debility, and headache demands detailed study. Is this spurious or real, a function of changes in certification or a true alteration in morbidity? Answers to such questions can come only from more detailed tests of the validity of the data. The alteration in the rate for peptic ulcer parallels other findings for this disease complex (H.I.P.E. reports). The consistent rise in incapacity from fractures, sprains, head injury (including skull fracture), and injury of other unspecified nature may be due entirely to the rise in morbidity from motor vehicle accidents; a full analysis of cause of injury is required and by 1966 should be possible.

The special inquiry was an attempt to amplify the routine data by linking for a sample of men of known occupation, spells of sickness occurring among those men in a calendar year. This data itself is of considerable value apart from the examination of the effect of occupation, area of residence, and sick pay schemes on incapacity.

The area data for "all causes", "bronchitis", and "arteriosclerotic heart disease" show little difference when compared with the latest area mortality data for either the Standard Regions or 46 County Boroughs for which comparable data were available. Table III gives the correlation coefficients obtained between the mortality and morbidity data. There is a considerable difference between the occupational mortality from "all causes" or "chronic bronchitis" and sickness absence; the correlation between sickness inception and S.M.R. was 0.15 for "all causes" for the 130 occupations that could be compared, and 0.4 for "bronchitis" for 111 occupations. In 24 occupations there was more than a 50 per cent. difference in the two ratios for "all causes"; Table IV shows the sickness was relatively low for "light" occupations or high for "heavy" occupations, compared with the mortality in these occupations. This finding is unlikely to be due to chance; possibly it indicates

TABLE III

CORRELATION COEFFICIENTS BETWEEN INCEPTION RATE OF INCAPACITY FOR WORK IN 1961-2 AND THE STANDARDIZED MORTALITY RATIO IN 1949-53 FOR VARIOUS POPULATION AGGREGATIONS

Population	Disease		
	All Causes	Bronchitis	Arteriosclerotic Heart Disease
46 County Boroughs	+0.62	+0.71	—
10 Standard Regions	+0.89	+0.78	+0.87
8 Conurbations and Large Towns	+0.67	+0.46	+0.84

TABLE IV

CLASSIFICATION OF PHYSICAL DEMANDS OF OCCUPATION FOR THOSE 24 OCCUPATIONS IN WHICH THE AGE-STANDARDIZED INCEPTION RATIO FOR SICKNESS WAS 50 PER CENT. LESS OR MORE THAN THE STANDARDIZED MORTALITY RATIO

Relation of Sickness Absence to Standardized Mortality Ratio	Number of Occupations in which Physical Demands were	
	Heavy or Moderate	Light
More than 50 per cent. higher	8	2
More than 50 per cent. lower	2	12

$\chi^2 = 7.8$ ; d.f. = 1;  $P < 0.01$ .

the effect of the physical demands of an occupation on the thresholds of incapacity.

CONCLUSION

The special inquiry is a major step forward in providing true incidence data for sickness incapacity. It showed the possibilities and the cost was only about £85,000. The area and occupational data for conditions with low mortality is unique, there being no other comparable data available in this country. The value of the work would be enhanced by repeat inquiries at intervals of 5 years, with design of data collection such that a more detailed statistical analysis could be carried out to examine the relative importance of the factors associated with incapacity for work. This should be followed by a more comprehensive interpretation of the data.

A minor point: insufficient warning is given that the data apply to Scotland as well as to England and Wales (a trap for one used to handling mortality data), and the definition of days is not given prominence (*i.e.* 6 days per week, 24 per month, and 312 days per year for 52-week year). The symbols for statistical significance in the special inquiry report are not readily memorized; a book-mark printed with them would aid interpretation of the Tables.

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