

Epidemiology of Sickness Certification

— A methodological approach based on a study from Buskerud county in Norway

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This paper is part of a broader study of doctors' "sickness certification" practice, which is correlated with, but not the same as, "sickness absence" or "sickness benefits". In order to obtain a total picture, information on sickness certification must be related to the population at risk, i.e. the epidemiology of sickness certification in a total population defined geographically. There is no routine registration system that provides statistics of sickness certification in Norway. Neither is there current information about those of the population who at any one time are entitled to sickness benefits, i.e. the population at risk. The aim of the present paper is to discuss the problems of estimating annual incidences of sickness certification, and to describe the results according to patients' sex, age, and place of residence. The study is based on all "initial certificates" received at the National Insurance Offices in Buskerud county during a period of four weeks in 1985. The population at risk was estimated at 106 019 employed persons aged 16-69 years, and the annual incidence of sickness certification at 580 per 1 000 employed persons per year (females 596, males 568). The highest incidence was found in the age group 20-29 years (females 739, males 741). In the age groups 30-39 and 40-49 years, incidences were significantly higher in females than males. The standardized incidence ratio was significantly lower than average for both females and males in agricultural municipalities, while it was significantly higher than average for females 30-39 years old in urban municipalities. The basis of epidemiological studies of sickness certification used in health services planning and in community medicine is in need of improvement. This challenge is being addressed by the National Insurance Administration in association with the Central Bureau of Statistics in Norway.

Key words: sickness certification, epidemiology, community medicine, health services planning, occupational medicine, family medicine.

INTRODUCTION

Several studies have focused on "sickness absence" and "sickness benefits", but little attention has been paid to doctors' "sickness certification" practice (1). It has been estimated that doctors issue a sickness certificate to 11-35 % of patients in general practice. Some authors suggest that the task of sickness certification might be taken over by other professions than doctors, or by self-certification (2,3). However, the ongoing discussion indicates that documenting incapacity for work will remain the doctors' responsibility (4).

In economic terms, sickness certification is the single task in general practice generating most public expenditure (5). This suggests that it is a subject of importance, not only to general practitioners and their patients, but also in health services planning and community medicine. Studies of sickness certification in general practice or in certain branches of industry give a limited picture of the total distribution of sickness certification (1). In order to obtain a total picture, information on sickness certification must be related to the population at risk, i.e. the epidemiology of sickness certification in a geographically defined population (1, 4, 6).

The aim of the present paper is to address the problems of defining the population at risk, i.e. the denominators of the incidence rates, and of obtaining the correct and total number of initial certificates issued to a defined population at any one time. Solving these problems will allow an estimate of the annual incidence of "initial certificates" by sex, age, place of residence, etc. in a defined geographical area. The paper is part of a broader study of doctors' sickness certification practice (1,7).

Table 1. Total population and estimated number of employed persons 16-69 years of age in Buskerud county in Norway, by sex and age at the start of 1985 (18, 24)

Age	Total population		Rate of employment ^a		Estimated no. of employed persons	
	Female	Male	Female	Male	Female	Male
16-19	6612	6981	0.393	0.416	2599	2904
20-29	15277	15856	0.673	0.784	10281	12431
30-39	16556	17052	0.734	0.954	12152	16268
40-49	11879	12243	0.823	1.000	9776	12243
50-59	10964	10870	0.645	0.869	7072	9446
60-69	12764	11625	0.338	0.562	4314	6533
Total	74052	74627	0.624	0.802	46194	59825

^a Rate of employment derived from "Labour Market Statistics 1985", Central Bureau of Statistics of Norway (13).

METHODS

Definitions

- *Sickness certification* is a declaration issued by a doctor to a person entitled to sickness benefits when this person is found to be temporarily incapacitated for work because of disease or illness (1).

- *Initial certificate* is the first document issued by a doctor to declare a person's incapacity for work.

- *Employed persons* in the present study include all employees, self-employed persons, farmers, fishermen, civil servants, military personnel, and unemployed persons seeking work.

The act of issuing an initial certificate is studied in the present paper. It is not to be confused with "sickness absence" or "sickness benefits", topics referred to when necessary in the discussion of the results. The definitions of concepts related to "sickness certification", e.g. "sickness absence", "leave", and "absenteeism", are discussed elsewhere (1).

The national sickness benefit scheme in Norway

The National Insurance Act in Norway covers all employed persons (including unemployed persons seeking work) (8). To obtain sickness benefits a sickness certificate (National Insurance's standard form 3.01 A) must be issued by a doctor. However, the first three calendar days of sickness absence may be declared by self-certification. Self-certification constitutes three-quarters of the total number of episodes of sickness absence in companies, but only one-fifth of days lost (9). All persons registered as employees, even those working only one hour per week, are entitled to sickness benefits from the first day of sickness absence. Sickness benefits for the first 14 days are usually paid by the employer. However, self-employed persons and farmers receive sickness benefits for the two first weeks only when they take out supplementary insurance. From the 15th day to one year, sickness benefits are paid by the National Insurance to all employed persons. After one year, persons who are still incapable of work are entitled to rehabilitation benefit or disability pension.

Study population

Buskerud county, located in the middle of southern Norway, had 21 municipalities and 219257 inhabitants at the beginning of 1985 (10). The distribution by sex, age, and branch of industry of employed persons in Buskerud is roughly similar to that of Norway as a whole (11, 12). Less than 2% were unemployed in 1985 (13). In Buskerud, 331 doctors were economically active, and 142 (43%) of these worked in general practice in 1985 (14). The number of residents per general practitioner in Buskerud, 1544, was similar to that for the country as a whole, 1502 (10). With respect to these variables, Buskerud appears to be like Norway as a whole.

Procedure

A feasibility study was carried out during one week in November 1984. All the 20 National Insurance Offices were visited in January 1985, to give personal instruction by one of the authors (G.T.) to at least two persons at each office. In this way, study procedure was tested and improved. During the four weeks from 25 February to 24 March 1985 copies of all initial certificates for persons aged 16-69 years received at the National Insurance Offices of Buskerud were mailed daily to the authors. "Sickness absence" documented by self-certification without an initial certificate issued by a doctor was not included in the present study.

Variables

- *Sex and age* were analysed in accordance with information contained in the national identification number written on the initial certificate. Age was calculated in completed years at the end of 1985.

- *Municipalities* were grouped according to the classification used by the Central Bureau of Statistics of Norway (15). This classification is mainly based on information about prevailing branches of industry in the community, location of the community (geographic proximity to main population centres), and population density.

- *Urban/Rural*. The municipalities of Drammen, Kongsberg, and Ringerike were classified as urban in this

Table 2. Annual incidences of sickness certification by sex and age in Buskerud county in Norway. Incidences (Ir) are expressed as rates per 1 000 employed persons per year, and estimated on the basis of number of initial certificates (n) registered during the four-week period 25 February–24 March 1985

Age	Females		Males		Total	
	n	Ir	n	Ir	n	Ir
16–19	54	253.4	121	508.1	175	387.8
20–29	623	739.0	755	740.7	1 378	739.9
30–39	591	593.1	694	520.2	1 285	551.4
40–49	455	567.6	460	458.2	915	506.8
50–59	348	600.1	427	551.3	775	572.2
60–69	186	525.8	328	612.3	514	577.9
Total	2 257	595.8	2 785	567.7	5 042	580.0

study, and all the other municipalities as rural (16). Drammen was the most urban municipality, with 96% of the residents living in densely populated areas (15). Corresponding percentages for Kongsberg and Ringerike were 78 and 64, respectively.

– *Reliability.* Fewer than one per cent of the initial certificates registered were excluded because doctors had erroneously used initial certificates instead of continuation certificates. Information about the patients' sex, age, and residence was checked against the National Insurance Administration's data-base for persons registered as inhabitants of Buskerud. Less than two per cent of the data had to be corrected.

Estimation of annual incidence

– *Numerators* were based on the numbers of initial certificates registered during the period of four weeks from 25 February to 24 March 1985. Procedure for estimating numerators for annual incidence rates took into account the seasonal variations of sickness certification observed in Drammen during a ten-year period. Corresponding figures for the other municipalities were not available, but the seasonal variation is probably the same in all municipalities of Buskerud. In 1985 the proportion of initial certificates in Drammen was 8.2% for the registration period compared with the full year (Østensvik R., National Insurance Office of Drammen. Personal communication).

– *Denominators.* Numbers of employed persons by sex, age, and residence were not available for the year 1985. The numbers had to be estimated by applying available national rates of employment derived from the Labour Market Statistics 1985 to the population figures for persons aged 16–69 years at the beginning of 1985 in each of the municipalities of Buskerud (Table 1) (10, 13).

To obtain the annual incidence rates of sickness certification per 1 000 employed persons in 1985, the following formula was used:

Annual incidence =

$$\frac{\text{No. of initial certificates registered during four weeks}}{\text{No. of employed persons}} \times \frac{100}{8.2} \times 1000$$

Statistics

“Statistical Analysis System” was used in the analysis of the data (17). The statistical significance of a difference between two incidences was calculated by using the chi-square test. The Mantel-Haenszel method was used when an adjustment for age was performed (18). Standardization by the indirect method was used to calculate the standardized incidence ratio (SIR) (19). Estimation of expected number of initial certificates was based on sex- and age-specific rates for the county as a whole. The expected numbers in a defined geographical area are compared with the observed figures for that area by observed/expected ratio. $\text{SIR} = \text{observed number/expected number} \times 100$. The chi-square test was used when comparing observed with expected. 5% was chosen as the level of significance.

RESULTS

During the period of four weeks, 5 042 initial certificates were registered. These certificates concerned 4 858 persons, of whom 184 had received two initial certificates and started two separate episodes of sickness certification. These episodes are considered to be independent and the analyses are based on all the 5 042 initial certificates.

The procedures described for estimating numerators and denominators provide, for the first time in Norway, population-based annual incidences of sickness certification in a defined geographical area. The incidence of sickness certification for Buskerud county as a whole was 580 per 1 000 employed persons per year (Table 2). It was higher for females than males, but neither the crude sex difference nor

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age group may be that they are beginning their professional careers, when they establish a family and have small children. This setting may lead to extra stress and an increase in episodes of acute illness. In addition, they may have children in kindergarten, where there is a high risk of acquiring respiratory infections. This is in agreement with Isambert-Jamati, who reported a higher rate of absence from work in women with one child or more, compared with women without children (25).

The significantly higher incidences found for 30-49 year-old females may be explained by the demanding life situation for working females who also have to cope with children and house work (26). The significantly higher SIR for 30-39 year-old females in urban areas may also be related to the lower social network in many urban areas compared with rural areas.

Low SIRs in agricultural municipalities, service municipalities and rural areas may be explained by the high proportion of farmers in these districts. Few farmers (5%) take out supplementary insurance (12, 27). Therefore many probably do not contact a doctor to be certified sick for illnesses expected to last less than two weeks, and accordingly they receive less sickness benefit than employees.

It is also likely that farmers have a higher threshold with respect to obtaining a sickness certificate because their work forces them to carry on even when they are sick. Alternatively, the low SIR in agricultural municipalities and rural areas may also be caused by distinctive social and cultural factors in small communities. Such factors may also explain the reported higher rate of sickness absence in big companies compared with small ones (28). This may be one of the reasons for low SIRs in agricultural municipalities with small plants, and for high SIRs in municipalities along the coast.

community medicine is in need of improvement. This challenge is being addressed by the National Insurance Administration in co-operation with the Norwegian Central Bureau of Statistics. Future studies should address the problems underlying the high incidences of sickness certification in females and males aged between 20-29, the significant sex difference in 30-49 year-olds, and the high rate in 30-39 year-old females living in urban areas. Low rates of sickness certification in agricultural municipalities are another finding that requires more detailed investigation from a sociological and cultural point of view, in addition to the medical.

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