Incidence of Sickness Certification

Proposal for use as a health status indicator

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Tellnes G, Svendsen K-O, Bjerkedal T, Bruusgaard D. Incidence of Sickness Certification. Scand J Prim Health Care 1989; 7: 111–7.

Cause-, sex-, and age-specific incidences of sickness certification in a total population are reported. The population at risk of having a sickness certificate issued was 106 019 employed persons 16–69 years of age. The annual incidence of sickness certification was estimated at 580 per 1 000 employed persons per year (females 596, males 568). The most frequent causes of sickness certification, according to diagnostic groups, were diseases of the respiratory system, musculoskeletal/connective tissue diseases, mental disorders, and injuries. Adjusted for age, injuries were found to be less frequent causes of sickness certification among females than males ($p<0.001$), while the reverse was true for mental disorders ($p<0.01$). Among single diagnoses, "other nonarticular rheumatism" (including myalgia) was more frequent among females than males, while the opposite was true for "backpain without radiating symptoms" ($p<0.001$). Comparisons with morbidity studies indicate that diagnoses stated on initial certificates, issued to employed persons in the total population, give a reflection of a population's health problems. This suggests that sickness certification may provide a basis for a health status indicator which may prove useful in planning and evaluation of occupational health, general practice, and community health.

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

For the planning and evaluation of community health and general practice, epidemiological data on the general population are necessary (1). Population based data are needed on "diseases" in the clinical sense, on "illness" as experienced by the patients, and on "sickness" as the social consequence of health problems (2). In the area of sickness, most studies have focused on "sickness absence", and "sickness benefits" (3). Previous reports on "sickness certification" have mainly been surveys in general practice. Studies on the epidemiology of "sickness certification" have therefore been called for (3, 4).

The aim of the present paper is to describe population based cause-, sex-, and age-specific incidences of sickness certification. The paper is part of a broader study of doctors' sickness certification practice (3, 5).

MATERIAL AND METHOD

Definitions

– *Sickness certification* is a declaration issued by a doctor to a person entitled to sickness benefits when this person is temporarily incapacitated for work because of disease or illness (3).

– *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 unem-

Table I. *Annual incidence of sickness certification by age (ys = years) and diagnostic groups. Ir = incidence rate per 1 000 employed persons per year. n = number of initial certificates registered during four weeks, Buskerud county in Norway from 25 February to 24 March 1985.*

		Females			Males			Females and Males	
Diagnostic groups	ICD-8	16–39 ys Ir	40–69 ys Ir	16–69 ys Ir	16–39 ys Ir	40–69 ys Ir	16–69 ys Ir	16–69 ys Ir	n
Infective & parasitic diseases	I	33.1	13.8	24.3	30.5	15.1	23.2	23.7	(206)
Neoplasms	II	7.3	10.9	9.0	0.8	7.3	3.9	6.1	(53)
Endocrine, nutritional and metabolic diseases	III	2.4	4.6	3.4	2.3	3.0	2.7	3.0	(26)
Blood diseases	IV	1.5	0.6	1.1	1.5	0.4	1.0	1.0	(9)
Mental disorders	V	45.3	37.5	41.7	34.0	28.1	31.2	35.8	(311)
Nervous system, sense organs diseases	VI	11.2	9.8	10.6	12.3	10.4	11.4	11.0	(96)
Circulatory system diseases	VII	3.9	19.0	10.8	5.4	24.2	14.3	12.8	(111)
Respiratory system diseases	VIII	141.8	170.6	155.0	173.3	160.7	167.4	162.0	(1 408)
Digestive system diseases	IX	10.2	8.6	9.5	28.6	18.6	23.9	17.6	(153)
Genitourinary system diseases	X	48.7	31.7	40.9	10.8	7.3	9.2	23.0	(200)
Pregnancy, childbirth, puerperium	XI	53.1	2.9	30.1	–	–	–	13.1	(114)
Skin, subcutaneous tissue diseases	XII	11.7	8.6	10.3	15.0	9.1	12.2	11.4	(99)
Musculoskeletal, connective tissue diseases	XIII	139.8	152.7	145.7	148.6	141.3	145.1	145.4	(1 264)
Symptoms, signs, ill-defined conditions	XVI	50.7	33.4	42.8	27.0	40.6	33.4	37.5	(326)
Injuries & adverse effects	XVII	49.7	55.9	52.5	109.6	55.3	84.0	70.3	(611)
Unknown		7.3	9.2	8.2	6.2	3.5	4.9	6.3	(55)
Total		617.7 (n=1268)	569.9 (n=989)	595.8 (n=2257)	605.8 (n=1570)	525.0 (n=1215)	567.7 (n=2785)	580.0 (n=5042)	– (5042)

ployed persons seeking work. The definitions of concepts related to "sickness certification", e.g. "sickness absence", "leave", and "absenteeism" are discussed in a previous paper (3).

Material

The material of the present study was obtained from Buskerud county, located in the middle of southern Norway. Buskerud had 21 municipalities and 219 257 inhabitants (106 019 employed persons) at the beginning of 1985 (5). The distribution by sex, age, and branch of industry of employed persons in Buskerud is roughly similar to that of Norway as a whole, as was the number of residents per general practitioner.

Method

During a four week period (25 February to 24 March 1985), all initial certificates received at the 20 National Insurance Offices of the county of Buskerud were registered. To obtain sickness benefit in Norway, an initial certificate (standard form) must be issued by a doctor (6). The national sickness benefit scheme covers all "employed persons". In the present study, self-certifications were excluded unless they were followed by an initial certificate issued by a doctor. Those included were the 16–69 year-old "employed persons" who were residents of the county of Buskerud during that period. A detailed description of the material and method used in the present study is published elsewhere (5).

Variables

– *Diagnosis.* The first diagnosis stated by the doctor on the initial certificate was registered and considered as the main diagnosis and cause of sickness certification. (One additional diagnosis was written on 10.0% of the initial certificates, and two or three additional diagnoses in 0.5%). Diagnoses were

Table II. *Annual incidence of sickness certification by age (ys = years) and single diagnose. Ir = incidence rate per 1 000 employed persons per year. n = number of initial certificates registered during four weeks, Buskerud county in Norway from 25 February to 24 March 1985.*

		Females			Males			Females and Males	
		16–39 ys	40–69 ys	16–69 ys	16–39 ys	40–69 ys	16–69 ys	16–69 ys	
Single diagnoses	ICHPPC-1	Ir	Ir	Ir	Ir	Ir	Ir	Ir	n
Influenza	4700	50.7	76.1	62.3	76.0	77.3	76.6	70.4	(612)
Back pain without radiating symptoms	7289	49.7	42.6	46.5	67.9	61.4	64.8	56.8	(493)
Acute upper respiratory tract infection	4600	34.1	23.1	29.0	35.1	30.7	33.0	31.3	(272)
Other nonarticular rheumatism	7179	35.6	36.3	35.9	25.9	14.7	20.6	27.3	(233)
Other bursitis, tendimtis & synovitis	7310	17.5	23.1	20.1	22.4	19.9	21.2	20.7	(180)
Sinusitis, acute & chronic	4610	28.3	28.2	28.2	16.6	12.5	14.7	20.6	(179)
Depressive neurosis	3004	28.3	21.3	25.1	14.3	11.2	12.8	18.2	(158)
Bronchitis & bronchiolitis, acute	4660	5.8	21.9	13.2	13.9	17.7	15.7	14.6	(127)
Neurosis, other/ unspecified	3009	10.7	14.4	12.4	11.6	10.4	11.0	11.6	(101)
Acute tonsillitis & quinsy	4630	13.6	2.9	8.7	21.2	3.9	13.0	11.2	(97)
Other symptoms, signs, ill-defined conditions	7889	11.7	9.2	10.6	8.1	11.7	9.8	10.1	(88)
Back pain with radiating symptoms	7250	8.3	8.6	8.4	10.0	11.2	10.6	9.7	(84)
Shoulder syndromes	7170	6.8	13.3	9.8	5.0	12.5	8.6	9.1	(79)
Bruise, contusion, crushing	9290	4.4	5.8	5.0	13.9	8.6	11.4	8.6	(75)
Laceration/ open wound/ traum.amputation	8890	2.9	2.9	2.9	18.5	5.6	12.4	8.3	(72)
Sprain/ strain ankle	8450	7.3	8.1	7.7	12.0	3.9	8.2	7.9	(69)
Cervical spine syndromes	7200	9.3	8.1	8.7	5.8	3.9	4.9	6.6	(57)
Viral infection, unspecified	0799	4.4	4.0	4.2	8.1	6.9	7.5	6.1	(53)
Presumed infectious intestinal diseases	0090	7.8	2.3	5.3	6.9	4.3	5.7	5.5	(48)
Other complications of pregnancy	6490	21.9	1.7	12.7	–	–	–	5.5	(48)
Other diagnoses		251.4	206.9	231.0	206.4	193.2	200.2	213.6	(1 857)
Unknown		7.3	9.2	8.2	6.2	3.5	4.9	6.3	(55)
Total		617.7	569.9	595.8	605.8	525.0	567.7	580.0	(5 042)

coded according to the International Classification of Health Problems in Primary Care (ICHPPC-1) (7). Diagnostic groups are in accordance with WHO's International Classification of Diseases (ICD-8). Coding was performed by one of the authors (K-OBS).

– *Doctors'* identification was obtained from signatures on initial certificates. Information on their type of practice was identified from an official publication (8).

Reliability

Most of the diagnoses written on the initial certificates were easy to read (79.0%). The diagnoses were difficult to read in 18.5%, illegible in 1.5%, and no diagnosis was noted in 1.0% (n=48). Supplementary information from National Insurance Offices reduced the number of illegible diagnoses to seven, which were included in the category "diagnosis unknown" (n=55). Reliability of coding of diagnoses was tested by two procedures:

– *Intra-observer variation* was tested by coding diagnoses written on 200 random initial certificates twice by the same doctor (one of the authors; K-OBS). There was an interval of two months between the first and second codings. The concordance (observed proportion of agreement) was 97.0% for diagnostic groups, and 91.5% for single diagnoses.

– *Inter-observer variation* was tested by comparing two of the authors' (GT and K-OBS) coding of diag-

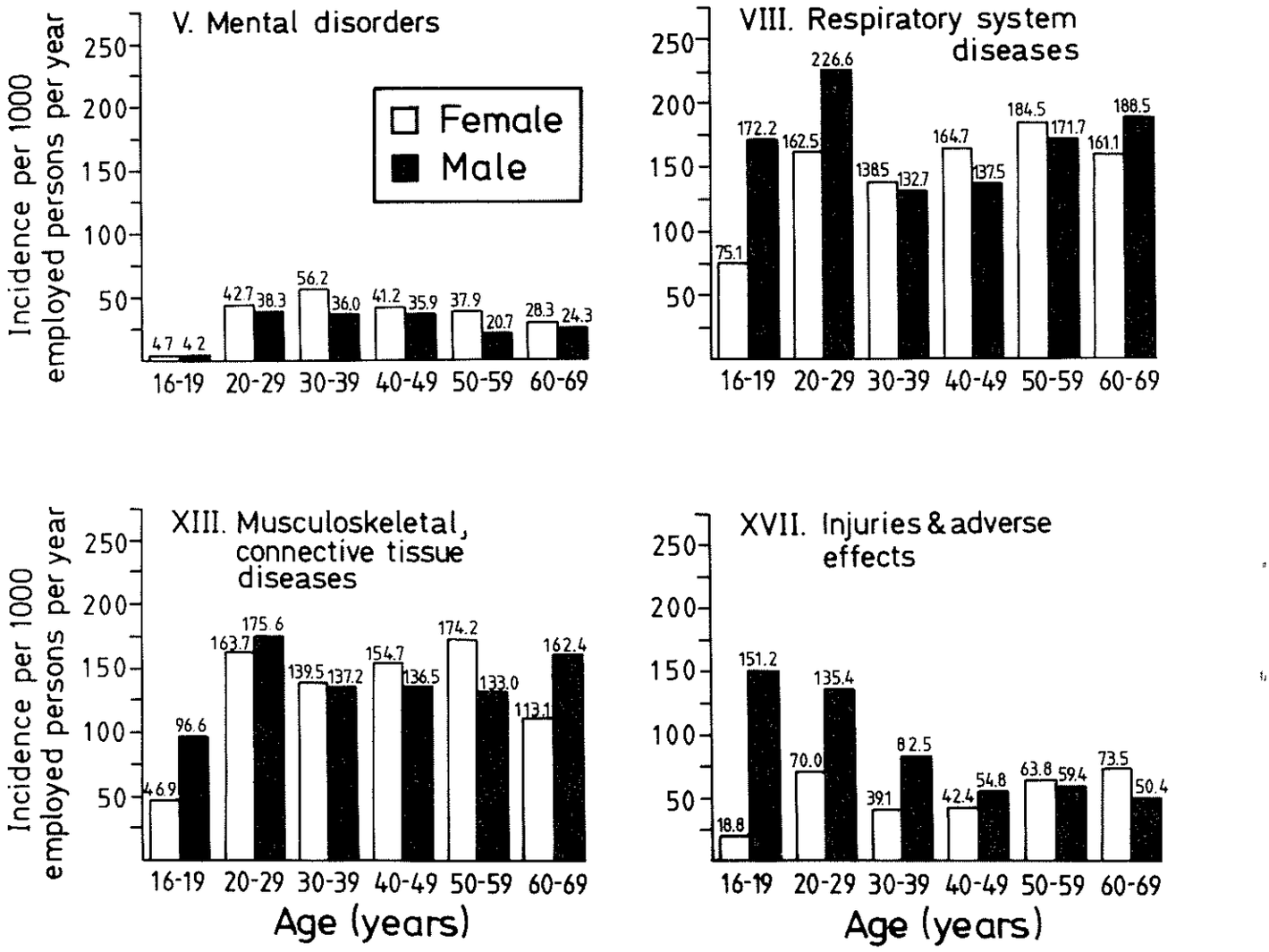

Fig. 1. Annual incidence of sickness certification by sex and age in the four most frequent diagnostic groups. Buskerud county of Norway, 1985.

noses written on the same 200 initial certificates as used in testing intra-observer variation. The concordance was 91.0% for diagnostic groups, and 75.0% for single diagnoses. The lack of exact concordance, especially for single diagnoses, was assessed as having limited clinical consequences.

Measurement and statistics

The incidence of sickness certification was expressed as the number of initial certificates per 1000 employed persons per year (5). When two incidences were compared, the chi-square test was used, and the Mantel-Haenszel method was used to adjust for age (9). The level of significance was set at 5%.

RESULTS

During the period of four weeks, 5042 initial certificates were registered (females 2257, males 2785). General practitioners issued 80.9% of the initial certificates, hospital doctors 13.2%, private consultants 2.0%, occupational doctors 1.6%, and others/unknown 2.3%.

The annual incidence rate was estimated at 580.0 per 1000 employed persons per year (females 595.8, males 567.7). Incidence rates and standard incidence ratios according to sex, age, and place of residence are described elsewhere (5).

Table I shows that the two most frequently noted diagnostic groups were respiratory system diseases and musculoskeletal/connective tissue diseases. Their incidences were twice as high as that of injuries, and four times as high as those of mental disorders and "symptoms, signs and ill-defined conditions". The two most common "single diagnoses" (Table II), "influenza" and back pain without radiating symptoms, were about twice as frequent as the two next common, i.e. "acute upper respiratory tract

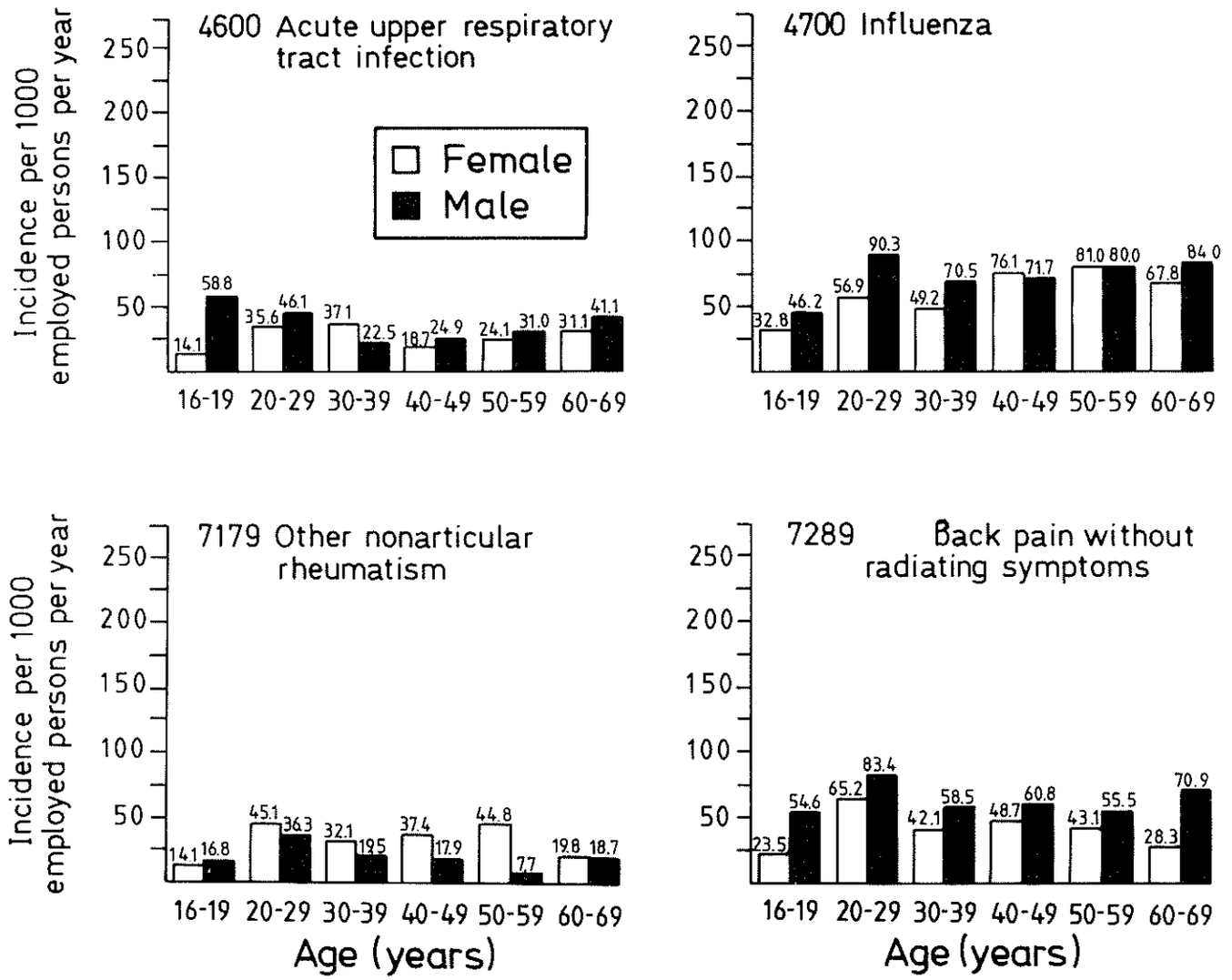

Fig. 2. Annual incidence of sickness certification by sex and age in the four most frequent single diagnoses. Buskerud county of Norway, 1985.

infection", and "other nonarticular rheumatism" (including myalgia).

Figure 1 shows that the incidence of respiratory system diseases and musculoskeletal/connective tissue diseases were similar in both sexes when adjusted for age. Injuries were less frequent in females ($p<0.001$), while mental disorders were more frequent ($p<0.01$). Back pain without radiating symptoms was less frequent in females ($p<0.001$) (Figure 2), while "other nonarticular rheumatism" was more frequent ($p<0.001$).

In general the variation with age was small in the most frequent diagnostic groups and for single diagnoses (Figure 1 and 2). However, injuries were most frequent in the youngest age groups, and the incidences decreased with increasing age in the 16–49 year-old males. Mental disorders were most frequent in the 30–39 year-old females. In males, digestive system diseases were more frequent in those under 40 years of age (Table I). The third most frequent diagnostic group in the under 40 years of age females resulted from the complications of pregnancy.

DISCUSSION

Validity problems

The diagnoses stated on the initial certificates may not always be valid, i.e. may not reflect the disease noted in the doctors' records, particularly with respect to mental disorders and psycho-social problems. Many of these patients have somatic problems as well, and the somatic diagnoses may be preferred when an initial certificate is issued (10).

"Symptoms, signs and ill-defined conditions" was the fourth commonest diagnostic group (Table I). This reflects the uncertainty when initial certificates are issued at an early stage of disease. A study in Sweden compared diagnoses on initial certificates with information noted in doctors' records (11). A

concordance of 88% was found, though the validity was less certain for single diagnoses than for diagnostic groups. This indicates that diagnoses stated on initial certificates give a valid reflection of doctors' assessment of health problems causing sickness certification.

The registration period of the present study was in the winter, and the cause-specific incidences of sickness certification may be different from the annual average, e.g. for influenza and acute upper respiratory tract infection. More valid cause-specific annual incidences would be provided by a routine registration of initial certificates rather than the ad hoc registration of the present study. However, in 1985 there was no routine registration system that provided statistics about medical information stated on sickness certificates (5).

Comparison with sickness certification studies

A population based Swedish study reported that acute upper respiratory tract infection and influenza were the dominating causes of "sickness absence" (12). For episodes with a duration of four days or longer, there were 257 episodes per 1 000 persons entitled to sickness benefits, compared with 162 per 1 000 employed persons per year in the present study. The period of self-certification in Sweden is one week, and this methodological difference from the situation in Norway may partly explain the higher rate. Back pain, with or without radiating symptoms, and nonarticular rheumatism were also among the most frequent diagnoses in the Swedish study, which is similar to our findings.

In Rutle's study of sickness certification in general practice in Norway, the distribution of diagnoses was somewhat different, and respiratory system disease was not the most frequent diagnostic group (13). This discrepancy may be explained by the fact that Rutle registered continuation certificates and return-to-work certificates in addition to initial certificates, and that respiratory system diseases are often of short duration, and rarely in need of continuation certificates. Weingarten & Hart, however, in a study from general practice in Israel, reported that about 30% of the initial certificates were for acute upper respiratory tract diseases (14). Musculoskeletal/connective tissue diseases, injuries, and mental disorders were the other most frequent diagnostic groups in those two studies from general practice (13, 14).

Comparison with morbidity studies

The most frequent diagnostic groups in the present study were the same as in the National health survey 1985 (15). Grimsmo's findings from southern Norway were similar (16), and he reported a higher rate of health problems in females than males in all groups aged 25 years and older. Though Grimsmo's study represents a sample of the total population, the finding is partly in accordance with the present study, which reports significantly higher incidences in 30–49 year-old females (5). In addition, Grimsmo reported a similar incidence for females and males with respect to diseases of the respiratory system and musculoskeletal/connective tissue, a lower incidence in females for injuries, and higher in females for mental disorders. These sex differences are the same as in our study.

The highest incidences of injuries were registered in persons under 40 years of age, with significantly lower rates in females. This sex and age pattern is the same as that in epidemiological morbidity studies of injuries (17). The finding that back pain was less common in females than males, in all age groups (Figure 2), has also been reported for all encounters in general practice (13). On the other hand, females had a significantly higher incidence of "other nonarticular rheumatism" in all age groups, which is similar to the present study.

Conclusion and suggestions

Comparison with morbidity studies indicate that diagnoses on initial certificates give a reflection of the distribution of health problems in the population. This is particularly true with respect to the most frequent diagnostic groups for which the diagnoses stated on initial certificates are valid (11). This suggests that sickness certificates may be a useful basis for a health status indicator, covering 80% of the total population aged 20–60 years (5).

The World Health Organisation suggests that "all countries should make an extensive review of their health information systems and adapt them to the needs of their strategies for health for all (1). To avoid unnecessary expenditure, relevant data should be extracted as far as possible from findings of existing population based surveys in the health and other sectors". Using doctors' sickness certification as a routine health status indicator is a new possibility in Norway, made available by the routine computer network recently established by National Insurance.

Information obtained from this new information technology system could be used in the planning and evaluation of occupational health, general practice, and community health.

Like illness and disease, sickness certification is influenced by factors other than sex and age, e.g. occupation, unemployment, etc. This study is limited by the information presently contained on sickness certificates. If in the future sickness certificates could include variables as mentioned above, such information would further improve the use of sickness certificates as a health status indicator.

ACKNOWLEDGEMENTS

The study was supported by the Norwegian Ministry of Health and Social Affairs, National Insurance Administration, Association of Norwegian Insurance Companies, and the Norwegian Employers' Confederation. We thank Leiv Sandvik for comments on the statistical analysis, and are indepted to the National Insurance Offices in Buskerud for registration of the data.

REFERENCES

1. World Health Organisation. Targets for health for all. Copenhagen: WHO, 1985.
2. Rosén M. Epidemiology in planning for health with special reference to regional epidemiology and the use of health registers. Umeå: Spri, 1987.
3. Tellnes G. Sickness certification in general practice: A review. Fam Pract 1989; 6: 58–65.
4. Fried RA. Commentary. J Fam Pract 1988; 26: 854–5.
5. Tellnes G, Bjerkedal T. Epidemiology of sickness certification. Scand J Soc Med. In press.
6. National Insurance Administration. Sickness allowance – The National Insurance scheme. Oslo: National Insurance Administration, 1985.
7. Bentsen BG. ICHPPC International Classification of health problems in primary care. Trondheim: University of Trondheim, 1977 (in Norwegian).
8. Helsedirektøren. Fortegnelse over leger i Norge i 1986 (Doctors in Norway in 1986). Oslo: Helsedirektøren, 1986 (in Norwegian).
9. Fleiss JL. Statistical methods for rates and proportions. 2nd ed. New York: John Wiley & Sons, 1981.
10. Tellnes G, Fugelli P, Bjørndal A. Treatment of mental problems in general practice. Scand J Soc Med 1987; 15: 131–7.
11. Bjurulf P, Eriksen T, Johanson G. Analys av sjukfrånvaro (Analysis of sickness absence). Linköping: Forsikringskassan, 1988 (in Swedish).
12. Riksförsäkringsverket. Den ersatta sjukfrånvarons diagnoser 1983 (Sickness absence by diagnoses in 1983) Statistisk rapport Is-R 1987: 5. Stockholm: Riksförsäkringsverket, 1987 (in Swedish).
13. Rutle O. Pasienten fram i lyset (Patients in general practice). Oslo: SIFF Gruppe for helsetjenesteforskning. Rapport nr. 1, 1983. (English summary) (in Norwegian).
14. Weingarten MA, Hart J. Sick leave certification in general practice. Aust Fam Physician 1984; 13: 702–11.
15. Central Bureau of Statistics of Norway. Health survey 1985. Oslo: Central Bureau of Statistics of Norway, 1987.
16. Grimsmo A. Fra å bli syk – til å bli pasient (From illness – to being a patient). Oslo: SIFF Gruppe for helsetjenesteforskning. Rapport nr. 1, 1984 (in Norwegian).
17. Baker SP, O'Neill B. Karpf RS. The injury fact book. Lexington: Lexington Books, 1984.

Received July 1988.
Accepted March 1989.