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# Some determinants of sick leave for respiratory disease.

-Occupation, asthma, obesity,  
smoking, and rehabilitation.

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AKADEMISK AVHANDLING

som för avläggande av medicine doktorsexamen vid Karolinska Institutet  
offentligen försvaras i hörsalen, AFA, Klara Södra Kyrkogata 18, Stockholm  
fredagen den 11 oktober 2002, kl 09.00



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## ABSTRACT

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The cost to society of sick leave and disability pensions is currently the most urgent economic problem in Sweden. The availability of a large sick-listing database, Collective Group Health Insurance, AGS (in Swedish: Avtalsgruppsjukförsäkring) provides a rare opportunity to study sick leave in Sweden. Periods of sick leave exceeding 14 days are recorded together with a mandatory diagnosis by a physician, gender, age, residential area, name of the employer, and occupation.

**Aim:** The overall aim was to investigate some determinants of sick leave because of respiratory disease, and to validate the AGS sick leave register regarding asthma.

**Methods:** In paper I data of sick leave periods exceeding 14 days, for all manual and service employees in the private sector in Sweden during 1992-94 (n=221,249) were analysed with special regard to respiratory diseases and occupation. In paper II a validated asthma questionnaire was distributed to persons less than 56 years of age registered with a sick leave period starting in 1994 due to a) asthma, b) any other respiratory diagnosis and c) a random sample of 8% of all persons registered under any other diagnosis. In papers III, IV and V a diagnosis of asthma was made using a three-stage model (questionnaire, telephone interview and clinical examination) in persons less than 56 years of age on sick leave due to any respiratory disorder. In paper III the prevalence of obesity was investigated; in paper IV differences between subjects with and without a previous asthma diagnosis were studied and in paper V the long-term effects of a structured rehabilitation programme for asthmatics were analysed.

**Results:** The incidence of long-term ( $\geq 90$  days) sick leave due to respiratory diseases differed three times between occupations. There was a high correlation ( $r=0.80$ ) between the incidence of long-term sick leave due to respiratory disease and long-term sick leave due to other conditions, suggesting that market and selection factors may play an important role in determining the overall risk of sick leave in various occupations. Agricultural workers, industrial workers, food industry workers and painters were occupations with an increased risk of respiratory sick leave. In the questionnaire study, asthma was found to be an underreported diagnosis, approximately by a factor of three. In the study of obesity in paper III the prevalence of obesity in asthmatics on sick leave was 20.7%, compared with 13.7% in the non-specific pain patients on sick leave and in 6.5% of a random general population sample ( $p<0.001$ ). In paper IV it was shown that smoking was more prevalent in persons not diagnosed as having asthma prior to the study, than in those with a previous asthma diagnosis, (60% vs. 41%,  $p=0.006$ ), and symptoms were less frequently reported ( $p<0.001$ ) by those who had not been diagnosed with asthma by a physician prior to the study. In paper V it was reported that the median number of sick leave days in the rehabilitation group was 104, and in the usual care group 167. An analysis of a subgroup consisting of persons not currently smoking with a previous diagnosis of asthma by a physician ( $n=57$ ) showed a significant effect on sick leave at three years (median number of days 63 in the rehabilitation group vs. 361 in the control group,  $p=0.042$ ).

**Conclusions:** Major differences regarding long-term sick leave due to respiratory disease were found among manual and service occupations. Several occupations, where exposure to respiratory sensitizers and irritants are known to occur, were among those where workers had an increased risk of long-term respiratory disease. There is evidence that asthma is an underreported diagnosis among persons on sick leave due to respiratory diagnosis, either because the reason for an asthma exacerbation is stated on the certificates of illness, or that asthma is not diagnosed among persons seeking medical attention due to respiratory problems. This is most evident in mild disease but also among smokers. The prevalence of asthma among persons on sick leave due to respiratory symptoms was 27% in the questionnaire study and 43% when the structured three-stage model for an asthma diagnosis was employed. Persons on sick leave for more than 14 days due to respiratory symptoms should therefore be clinically investigated with the suspicion of asthma. Obesity is substantially more prevalent among persons with asthma than in a general population sample, especially among women. It is, however, not clear whether the increased prevalence of obesity among asthmatics reflects a true increase of obesity in persons with

asthma or whether asthma-like symptoms occur because of obesity. Obesity and asthma could also have a common primary factor. Morphological studies on obese patients with asthmatic symptoms are needed.

Smoking seems to worsen asthma symptoms during exacerbations in patients with mild disease, leading to periods of sick leave where the duration is similar to that which is found in patients with more severe asthma. The extensive in-patient asthma rehabilitation programme had major effects on sick leave only for those who did not currently smoke. This could indicate that smoking is the major determinant for respiratory sick leave, regardless of cause and regardless of treatment.

Keywords: asthma, COPD, cost of illness, obesity, occupations, public health, sick leave, rehabilitation, smoking, treatment outcome