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### Prevalence of hand eczema

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*Document Version*

Publisher's PDF, also known as Version of record

*Publication date:*

1983

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

Coenraads, P. J. (1983). *Prevalence of hand eczema*. s.n.

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### Summary

This thesis describes and discusses the results of a series of investigations into the occurrence of skin diseases of the hands and forearms. The problem is approached from an occupational dermatological point of view and focuses on contacteczema/dermatitis, which is the primary component of the spectrum of hand dermatoses and, except for trauma, also the most frequently reported work-related disease.

The first chapter includes a discussion of the two major categories of hand dermatoses: irritant contact dermatitis and allergic contact eczema. A number of other common dermatoses, the clinical picture of which may mimic irritant dermatitis or allergic eczema, is considered for differential diagnostic purposes. The course and prognosis of eczema of the hands in relation to occupation are discussed by using data obtained in earlier investigations by the author.

The second chapter provides some basic information on the epidemiological and statistical aspects which are of importance in the planning phase of a cross-sectional study of eczema in selected populations. In particular, problems concerning the comparison of the prevalence of eczema in the general populations with that in an occupational group, i.e., construction workers, are discussed.

The types of studies commonly used to determine the prevalence and incidence are briefly reviewed and the limitations of the prevalence as a summary measure in a cross-sectional study design are discussed. The sensitivity and specificity of the screening methods for the detection of hand eczema are illustrated with examples. The chapter also describes the calculation of the desired sample size, i.e., the minimum number of construction workers to be screened in order to be able to detect a higher prevalence than in the general population. The calculations are based on estimates of the eczema prevalence in the general population obtained by studies such as described in Chapter 3. The method of sampling is also outlined. In addition, it is pointed out that a case-control study would increase the efficiency of the cross-sectional study in a population of construction workers. Major sources of bias

that may influence the study results are reviewed.

Chapter 3 contains an analysis of the results of two investigations into the prevalence of skin disorders of the hands and forearms; the analysis focuses on eczema, particularly as related to occupation in males. Two samples selected from the general population in a rural and an urban area consisting of a total of 3140 adults were studied. The most important diagnostic category was eczema: the prevalence among males was 4.6% and among females 8%. There was a difference in age-adjusted prevalence between the two areas.

A further analysis was made of the prevalence among males, who could be classified into 6 major occupational groups. The mean ages were different in the various occupational groups. Also the distribution of the males over the occupational categories was different in the two areas. To assess the relative importance of age, occupation and area, a step-wise logistic regression of eczema prevalence was performed on these factors. The results show a significant contribution of the factor occupation to the prevalence of eczema in this model. The factor age did not contribute significantly before and after correction for occupation. Also the contribution of the factors area of residence and the interaction age-occupation was not significant.

Three major occupational groups in which the prevalences of hand eczema was relatively high could be identified: the chemical industry 14.4%, the metal industry 10.7% and the construction industry 7.1%. More irritant than allergic eczema was found in all of these categories. The appendix to this chapter describes the results of a reexamination of one of the samples after 3 years. The sensitivity and specificity of the methods used during the first examination were calculated. Patch testing could be arranged for all persons with eczema. The results of the patch tests emphasized the prominent place of irritant dermatitis within the spectrum of hand eczema.

A review of the literature published up to now with respect to dermatological studies in the construction industry is given in Chapter 4.

This review does not deal specifically with cement eczema in association

with chromate and cobalt allergy, but considers the available epidemiological data on skin diseases obtained by examining populations of construction workers. Such information is limited, since most of the available data are based on out-patient records and/or insurance files. For the Netherlands, data are provided by the 'Economic Institute for the Construction Industry Sector' (EIB), which are based on their permanent sample of construction workers. These data probably underestimate the true morbidity due to skin diseases in this workforce. The data reveal that many working days are lost, with important financial consequences. However, it has also been noted that, despite extensive dermatological problems, workers sometimes try to continue their work without even consulting a physician. A brief review of the two available reports on systematic investigations on building sites which were performed by Wahlberg (1969) and by Høvding (1970) is given. It is concluded that further investigations by trained dermatologists and experienced occupational physicians will be necessary to detect and study early cases of occupationally induced dermatoses, thus providing a more complete picture of the real medical and social importance of occupational dermatoses in this branch of industry.

The results of the examination of the hands and forearms of about 1700 construction workers are analyzed in Chapter five. These persons were all employees of a sample of construction companies located in the northern part of the Netherlands. They were seen at the work sites in the spring and early summer of 1982. A form of eczema was present in 133 (7.8%) workers, psoriasis in 22 (1.3%) and various other dermatoses in 30 (1.8%). Irritant dermatitis was the major diagnostic category and was found in 4%, while allergic contact eczema was present in 1.4%. The prevalence of eczema in different job categories varied between 5.9% in technicians and 12.6% in bricklayers and plasterers. From the persons without eczema, a control group of about 300 workers was selected and subjected to patch testing and history taking in the same manner as were the cases with eczema. A history of atopy was more prevalent in persons with irritant dermatitis (24%) as compared with other forms of eczema (15%) and controls (11%).

Patch testing was performed with dichromate, cobalt, thiurammix and epoxy-resin. Positive patch tests were found in 15% of the workers with eczema and in 5.5% of those without the disease. In carpenters, there was very little difference in the proportion of positive reactors to patch tests between cases with eczema (6.1%) and controls (4.3%). In bricklayers and plasterers, however, a difference was found: the proportion of positive patch tests being 24% and 7.6%, respectively, in cases and controls. In order to determine the importance of a history of exposure to paint & tar, glues, synthetic resins, wood impregnants, greases and solvents, the odds-ratios of exposure in cases vs. controls were analyzed. No significant association between eczema and such exposure could be detected when all occupations were combined, but, in the stratum containing the carpenters, a statistical association was found between eczema and a history of frequent exposure to wood impregnants (OR = 2.43) and solvents (OR = 1.86). The irritant nature of these substances underlines the importance of the role of irritant dermatitis in the spectrum of hand dermatoses, at least in carpenters. Other job strata were too small for a proper analysis. The association between eczema and exposure to woodimpregnants and solvents could be confirmed by performing a logit regression analysis in which other factors could be simultaneously examined. Several types of bias that may have distorted the data are briefly discussed in the appendix of this chapter.

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