



## **Original article**

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by [Plomp HN](#)

**Key terms:** [consultation hour](#); [health belief model](#); [occupational health](#); [periodic examination](#); [summoning](#)

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## Accessibility and utilization of occupational health services

by H Nico Plomp, PhD<sup>1</sup>

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**Objective** The purpose of this study was to evaluate employees' utilization of occupational health services in three Dutch companies in which the access to such services (open consultation hour, summoning and periodic health examination) is organized differently. Accessibility to occupational health services is considered to be adequate if workers with work-related health problems are reached.

**Methods** For a random sample (N = 911) utilization figures were determined. For a second, nonrandom sample (N = 313) with an overrepresentation of employees with work and health problems, interviews were conducted with regard to health and work problems and motives for utilizing occupational health services.

**Results** Workers with different profiles of work and health problems were reached through different types of access to occupational health services. To a large extent, the utilization of occupational health services is determined by the organization of its access.

**Conclusions** Accessibility of occupational health services is an important prerequisite of effectiveness and therefore a serious object for health policy and evaluation.

**Key terms** consultation hour, health belief model, occupational health, periodic examination, summoning.

Utilization is an important aspect of the effectiveness of health services, particularly for preventive programs designed to reach populations at risk (1). However, especially for those who are most at risk, underutilization has often been found with respect to immunization, screening, and educational programs (2, 3).

Several research reports and reviews have been directed towards understanding why people do not make use of available services that are evidently beneficial to them (4—6). The theory applied the most often to explain why people do or do not engage in various actions oriented towards preventive health is the health belief model. Preventive, health, and illness behavior is explained in the model by two categories of variables. On one hand, there is the "perceived threat or fear of a disease" stemming from perceived susceptibility and seriousness, and, on the other, there is the "perceived benefits and costs of preventive action." The empirical evidence obtained with the health belief model has been collected in various preventive programs. The model is criticized however because of its strong emphasis on individual and psychological factors. Mechanic (7) has applied social and cultural factors to explain different behavioral patterns. Other sociologists put emphasis on the social networks, the so-called "lay referral systems,"

to explain health and illness behavior (8). Hart, a medical geographer, has formulated the "inverse care law" saying that those with the greatest need for health care services get the poorest services and those with the least need have the best services at their disposal (9). There is evidence that this law is valid for the field of occupational health (10).

The different theories explaining the utilization of health services seem to be more complementary than conflicting. They refer to different aggregation levels (individual, primary group, and society) and types of explanatory factors (psychological, social, geographic, and economical).

This paper focuses on the behavior of employees towards the occupational health services of their company under various conditions of accessibility and, particularly, with respect to work and health problems. In The Netherlands, where the data were collected, employees generally have the following opportunities to contact such services: they can take the initiative themselves by visiting an open consultation hour; the occupational health personnel can contact the employees through summoning, often as a consequence of sick leave, and, finally an employee can be invited for a periodic health examination. These contacts derive from

<sup>1</sup> Institute of Social Medicine, Vrije Universiteit, Amsterdam, The Netherlands.

Reprint requests to: Dr H Nico Plomp, Institute of Social Medicine, Vrije Universiteit, Van der Boechorststraat 7, 1081 BT Amsterdam, The Netherlands.

legally prescribed tasks of occupational health services. Other opportunities for employees to contact occupational health personnel, like workplace visits and health promotion activities, are not addressed in this paper. Occupational and primary care services are strictly separated in The Netherlands.

Access to occupational health services can be organized in different ways that affect the chance of utilization. Consultation hours can vary with respect to frequency, geographic distance from a workplace, and accessibility (eg, necessity to make an appointment). In periodic health examinations the focus can be either on specific health risks or groups at risk or on the general worker population. Different methods of recruiting employees can be applied. For example, a personal invitation can be issued, or a general call, which will influence the chance of participation, can be made. The organization of the accessibility is considered adequate if an occupational health professional contacts the target group, namely, the employees who have health problems that are obviously work-related or who are vulnerable because of risks in their work. This paper addresses the following research questions: (i) what is the actual utilization of occupational health services through the different forms of access and under different organizational conditions and (ii) under what conditions do employees who report having health and work problems utilize the occupational health services of their company?

### **Materials and methods**

Data were collected in three companies (metallurgic, textile and chemical production) selected so that they differ with respect to size (more than 2000 employees versus less than 500), type of occupational health services (corporate occupational health services where staff has employee status or combined occupational health service where staff operate as external advisers), and branch. It is assumed that, to a large extent, these characteristics determine the type of health risks and the availability and accessibility of the different occupational health services. Injuries and musculoskeletal disabilities were expected to occur frequently in the metallurgic company, more attention to potential health risks and early detection was expected to be found in the chemical plant, while characteristic for the textile plant was the older work force and dust exposure. The supply and availability of services was supposedly influenced by the size of the company and the type of occupational health services (table 1). Table 1 provides more detail on the differences between the companies with respect to health risks, absenteeism, and available occupational health service staff. Information on the company and the organization of its occupational health services was gathered in inter-

views with key occupational health personnel and management.

In each of the selected companies, a random sample of employees (N = 911) was drawn from the personnel file to determine the utilization rates of the consultation hour, the summonings, and the periodic examinations from the medical records. This information was compiled in a short questionnaire by occupational physicians. The reason for the visits were also collected in this manner in the metallurgic and textile companies. In the chemical company, however, the reasons for contact had not been registered systematically; therefore the workers (only those selected from "functional units") who were interviewed were asked for this information.

A second stratified, nonrandom sample of employees (N = 313) was drawn that was interviewed about health status, the perceived health risks at work, and contacts with the occupational health staff during the past year.

The sampling procedure was applied. In each company three or four categories of workers were defined on the basis of the type of work and work conditions. From these categories one or two functional units (ie, a group of employees working under one supervisor) were selected at random. All employees of the unit, from the work floor to the highest management level, were included in the study and invited to be interviewed. In addition some employees were selected from files of workers with partial disabilities or at least 30 d of absenteeism during the previous year. They were considered to have more work-related health problems, and they represented about 30% of the second sample. This sample characterized the variation in health status, work conditions, and health-related problems.

The interviews took place close to the work floor and in employees' home in cases of absenteeism. After the interview the respondents were requested to complete a short questionnaire containing questions on health complaints (a 10-item index with items like back pain, headache, stomach disorder), health experience (Do you feel healthy?), work load (a 3-item index: physical, mental, time pressure), work conditions (an 8-item index containing inconveniences like damp, cold, noise), work relations (a 3-item index with items on colleague support, social climate) and work organization (a 3-item index on management style, work distribution, coordination processes). The response in all three companies exceeded 90%.

### **Results**

#### *Organization of the access to occupational health services*

The organization and procedure of the most important types of access to occupational health services in the

three companies are summarized in the third section of table 1. Clear differences between the companies appeared that can be ascribed to circumstances within the companies, such as the availability of physicians and health risks, but also to divergent assumptions about workers' behavior towards the services and ideas about good occupational health practice.

In the metallurgic company the open consultation hour was by far the most important access for employees, who could visit twice a day. The physicians spent most of their time on this activity. In this company the occupational health services provided by far the largest range of diagnostic and therapeutic facilities (like X-ray equipment, physiotherapy). These services were justified by the relatively high accident rate, but more important was the assumption that open consultation opportunities were the main means of contacting the large majority of the employees and staying informed of current activities, particularly with respect to work-related health problems. The arrangement of periodic health examinations,

considered of great importance for good practice in the textile and chemical companies, was marginal in the metallurgic company. Nor did the company's occupational health professionals summon workers on the basis of absenteeism and other signals of potential disturbances in the work-health relationship. Managers who wanted to have a medical assessment of a worker were reminded to refer the worker to the services. Summoning to consultation because of a work problem was assumed to undermine employees' trust in the services.

In comparison with the situation in the metallurgic company the ideas about good occupational health practice were very different in the textile and chemical companies. In both companies, it was assumed that health problems, especially work-related ones, should be identified by gathering signals from patterns of absenteeism, periodic examinations, and management. Therefore consultations took place on a regular basis with "social teams" comprising the occupational health physician, the personnel manager, the social worker, and the physician

**Table 1.** Characteristics of companies, occupational health services, and the organization of their access for employees in three companies.

	Metallurgic company	Textile company	Chemical company
<b>Company characteristics</b>			
Number of employees <sup>a</sup>	3478	443	2618
Absenteeism (percent per year)	7.2%	13.7%	9.3%
Shift work	None	Mainly two shifts	4 shifts for approximately 30% of work force
<b>Specific health risks</b>			
Average age of the work force	Injuries, noise, welding	Dust, climate, elderly workers	Chemical/toxicological
Urbanicity	39.5 years	44.0 years	41.0 years
	Nonurban	Nonurban	Urban
<b>Occupational health services</b>			
Type of organization <sup>a</sup>	Corporate	Combined	Combined
Available staff (hours a week)			
Physician	100 h	22 h	72 h
Nurse	40 h	—	72 h
Others	340 h	4 h	180 h
Numbers of employees per full-time occupational health professional	290	733	364
Diagnostic and therapeutic facilities	High (eg, X-ray equipment, physiotherapy)	Low	Medium (surgery, emergency equipment)
<b>Access for employees</b>			
<b>Open consultation hour</b>			
Frequency	Twice a day	Twice a week	Three times a week
Estimated percentage of worktime spent by occupational physician	60%	25%	25%
Current practice concerning summoning and referring workers to occupational health services	Referral by supervisors or personnel department; summoning mainly because of periodic medical examination	Systematically summoned as a result of regular consultation with insurance physician, social worker, and personnel manager, as well as because of periodic health examination	Systematically summoned on basis of absenteeism and structured consultation with personnel department, as well as because of periodic health examination
Periodic health examinations	For employees over 40 years of age, a questionnaire focusing on symptoms of cardiovascular diseases and diabetes was mailed every year	Employees over 40 years of age, are personally invited for biomedical tests (blood and urine samples), a health questionnaire and a consultation with the occupational health physician, every 2 to 3 years	Offered to employees over 45 years, every 2 to 3 years personally invited. Same content as in Company B, with additional examinations depending on the health risks in the workplace

<sup>a</sup> Selection criteria for the study.

representing sick-leave insurance. Workers were summoned more frequently — not only because of the results of the periodic health examinations as in the metallurgic company, but also because of absenteeism patterns and other signals.

Opportunities for open consultation were more restricted and special treatment facilities were lacking. In the chemical company only a nurse could be consulted directly, and this nurse then referred the worker to the occupational health physician if required or requested. Treatment for regular health problems was discouraged and considered primarily the domain of the family physician.

Compared with the services of the metallurgic company, those of the textile and chemical companies put considerably more effort into periodic health examinations, offering them to all employees over 40 years of age and offering them every two years for those over 45 years old of age. Blood and urine samples were collected, participants were requested to complete a health questionnaire including questions on work and health, and the occupational physician was visited to discuss the questionnaires scores. Results of the periodic health examinations, aggregated at the department or company level, were compared with those of a standard reference group and reported to management. The objective of the periodic health examinations of the two companies was to provide feedback to both the individual worker and management; it was considered to be an important preventive instrument with impact for both the individual worker and the company. The periodic health examinations in the metallurgic company had no other purpose than to detect risks of heart and vascular diseases at an early stage. From the age of 40 years on the employees were annually sent a questionnaire with questions on heart and vascular symptoms and the employees were summoned for additional examinations if suspicious symptoms appeared (7% over a year). They were then referred to their general practitioners if the suspicion was confirmed.

### Actual utilization

The actual utilization patterns of the random sample, as presented in table 2, clearly reflected the differences in organization of the access to occupational health services and the ideas about good practice, as has already been indicated. The percentage of workers having visited the open consultation hour in one year was by far the highest in the metallurgic company, 50%; in the textile and chemical companies, these percentages were 37.8% and 13.2%, respectively. These differences were even more striking with respect to the total number of visits, because spontaneous visitors incur more follow-up visits. In the metallurgic company 90% of all the visits occurred on the employees' initiative; in the textile and chemical companies the corresponding figures were 64% and 24%, respectively. The availability of visiting opportunities and the therapeutical facilities evidently influenced the number of visitors. In a remote department of the metallurgic company, with fewer treatment facilities and consultation opportunities, the number of visits was less than 50% as compared with the main part of the company, and 17% of the visitors to the occupational health services of the metallurgic company came for a referral to the physiotherapist. The chemical company had the lowest percentage of spontaneous visitors and the highest percentage of summoned visitors (31.5%). In the textile company 26% of the workers were summoned in one year, and in the metallurgic company the corresponding figure was only 8%. Participation in periodic health examinations was considerably higher in the textile and chemical companies. This result is in concordance with the emphasis put on this activity, as compared with the metallurgic company.

### Reasons for utilization

The reasons for the last spontaneous visit to the occupational health service were taken from the medical records kept by the occupational physicians in the metallurgic and textile companies. In the chemical company this

**Table 2.** Actual utilization of occupational health services through various types of access in one year.

	Consultation hour of occupational physician				Periodic health examination		
	Number of workers	Percentage of workers coming on own initiative last year	Percentage of workers summoned or referred last year	Number of visits per employee	Number of visits per visitor	Percentage of workers who participate in all opportunities during last 6 years	Percentage of workers who did not participate during last 6 years
Metallurgic company	313	50.4	8.3	1.6	3.1	47.0	28.6
Textile company	207	37.8	26.1	1.1	2.4	72.0	9.3
Chemical company <sup>a</sup>	391	13.2	31.5	0.6	1.5	82.3	14.6

<sup>a</sup> In the chemical company, 23% of the total population made at least one visit; assigning to the categories "own initiative" and "summoned" was based on the report of interviewed employees. In the metallurgic and textile companies these figures were derived from medical files by occupational physicians for a representative sample.

**Table 3.** Reason for last visit to consultation hour of the occupational physician on the worker's own initiative.

	Injury (%)	Minor ailments (%)	Other somatological impairment (%)	Complaint or request related to work (%)	Other reason (%)	Total (%)
Metallurgic company	17.3	58.0	16.7	1.3	6.7	100 (N = 151)
Textile company	13.0	37.0	33.3	5.6	11.2	100 (N = 68)
Chemical company <sup>a</sup>	21.3	30.6	16.7	13.9	16.7	100 (N = 36)

<sup>a</sup> Numbers of the chemical company were based on data reported by workers during interviews; for the metallurgic and textile companies the numbers were derived from files kept by the occupational physicians for representative samples.

information was gathered from interviewed employees because the occupational health service did not systematically register the reason for visits. Table 3, containing the results, shows that the differences between the companies were relatively small. In all the companies more than half of the visits were due to an injury or minor ailment. Despite different percentages of visitors, the reasons for workers visiting the occupational health services spontaneously under different conditions were roughly the same. It is remarkable that only a small portion of the spontaneous visits were made because of a work-related problem or complaint (in the metallurgic and textile companies as defined by the occupational health physician in the records and in the chemical company as defined by the interviewed workers). The assumption, in the metallurgic company, that work-related problems are presented to the occupational health service if there are enough opportunities for visiting is apparently not correct (table 4).

The reasons for the last summoned visit, as presented in table 4, revealed clearer differences between the companies. Evidently, the reason for summoning was directly influenced by occupational health policies, whereas those for spontaneous visits were only indirectly influenced by such policies. Absenteeism was the most important reason for a request to visit in the textile company and the least important one in the metallurgic company. However, not every worker who was absent from work for a longer period received a request to visit. If a consultation with the personnel department revealed that return to work was not obvious or desirable, the occupa-

**Table 4.** Reason for the last summoned visit to an occupational physician.

	Outcome of periodic health examination (%)	High or frequent absenteeism (%)	Other or unclear reason (%)	Total (%)
Metallurgic company	45.8	20.8	33.3	100 (N = 24)
Textile company	32.7	63.2	4.1	100 (N = 49)
Chemical company <sup>a</sup>	45.6	38.3	16.5	100 (N = 57)

<sup>a</sup> Numbers of the chemical company were based on data reported by workers during interviews; in the metallurgic and textile companies and the numbers were derived by occupational physicians from a representative sample from their files.

tional health physician could decide to remain "passive" and not summon the worker.

The reasons for beginning a program providing periodic health examinations were reflected by the definition of the target group and the frequency with which the employees were invited. The employees' reasons for accepting the invitation can be categorized under the following four headings: (i) it lowers the threshold of visiting a doctor, (ii) it helps reduce uncertainty about unknown illnesses, (iii) it helps prevent uncertainty about risks in the work environment, and (iv) even if it provides no help, it certainly does no harm.

Interesting also were the reasons a relatively small group of employees mentioned for not participating in periodic health examinations: practical circumstance (most common), self-selection (often mentioned by employees from the metallurgic company who got a mailed questionnaire focused on risk for heart and vascular diseases), and an unfavorable cost-benefit balance.

#### *Health and work as determinants of utilization*

An important criterion for evaluating the organization of the access to occupational health services is that workers with health and work problems are reached. In an effort to determine if health and work problems predetermine the utilization of certain occupational health services, the different indicators of health and work problems were included in a regression analysis. The results, summarized in table 5, show that different profiles of health and work problems were associated with the utilization of different types of access. Employees who visited the open consultation hour did not report more health or work problems, nor did they feel more unhealthy than the nonvisitors, but they reported more problems with work relations (colleagues, boss) and work organization (control of work, work pressure, social support). Health problems were reported significantly more often by the workers summoned to visit the occupational health service because of absenteeism or the result of a periodic health examination. These workers were older and had a higher absenteeism rate, but, in none of the companies, did the summoned workers report more problems with work load or work conditions. These problems were reported significantly more often by the workers who par-

ticipated in the periodic health examinations however. The significant associations presented in table 5 were found in the samples of all three companies with one exception. In the metallurgic company the employees who were summoned did not have a higher absenteeism rate. Obviously different kinds of problems are the focus of different types of access. This conclusion is supported by the fact that there was no correlation between the frequencies of open consultation visits, summoned visits, and participation in periodic health examinations.

## Discussion

This study clearly demonstrates that the utilization of occupational health services is largely determined by the organization of its accesses. Workers with work and health problems are not inclined to visit occupational health services more spontaneously. However, they do participate more frequently in periodic health examinations, while those with health problems have a greater possibility of being summoned. Creating more opportunities for open consultation and offering more treatment facilities, as in the metallurgic company, attracts more workers but does not change their motives for coming. The open consultation hour, which is the main gateway to the general practitioner, has a very restricted function for occupational health problems. If occupational health services intend to offer primary care, as in Finland (11), types of access other than open consultation hours should be provided, and, for the sake of effectiveness, it is advisable to make a clear distinction between primary care and occupational health activities.

Workers' utilization of the various types of access to occupational health services can be explained by the perception of benefits and cost, which is a central variable set in the health belief model. An important element of this cost-benefit balance is the trigger that makes someone utilize a service. The other element is the expected outcome. The trigger for a spontaneous visit to an occupational physician is mostly an acute health problem or request, and visitors have a rather concrete expectation about the outcome. Work-related health problems are usually not experienced as acute, however, and for most employees it is not obvious what contribution or benefit occupational health services can offer to these problems. The invitation to attend a periodic health examination is a trigger to participate for workers with work-related health problems because it lowers the threshold ("costs") to the system. Participation in periodic health examinations also depends on how employees are invited (by making a personal appointment or by mailing a questionnaire), and the objective of the program, which can make it more or less attractive for em-

**Table 5.** Work and health indicators associated with the actual utilization of occupational health services through different types of access. (regression coefficients,  $P < 0.05$ ,  $N = 313$ ) (NS = not significant)

Indicator	Open consultation hour	Summoned to consultation	Periodic health examination
Health complaints (10-item index)	NS	0.45	NS
Health experience	NS	0.52	NS
Workload (3-item index)	NS	NS	0.32
Work conditions (8-item index)	NS	NS	0.38
Work relationships (3-item index)	0.32	NS	NS
Work organization (5-item index)	0.42	NS	NS
Days of absenteeism during last year	NS	0.31	NS

ployees. Summoning employees because of absenteeism, or because of information from management or an insurance physician, is the most direct way to trigger contact that obviously would not be realized otherwise because of low expectations with respect to the outcome. Other factors affecting employees' cost-benefit evaluations of the utilization of occupational health services are the availability of alternatives for getting assistance for work and health problems (from the family doctor, one's own boss, or workers' council representatives), site-related factors like distance, accessibility, and the relationship to the consultant (12).

This study had an explorative character and took place in a single country. However, it clearly indicates that the organization of the accessibility and strategies to get in touch with target groups defined by health risks or problems ought to be an important point of consideration when occupational health programs are evaluated or designed. In an effective occupational health program the needs and target groups should first be defined precisely, preferably in empirically measurable terms (13) and then there should be knowledge about the determinants of workers' behavior towards occupational health services. Theories on workers' (patients') illness behavior mentioned in the introduction and on workers' perception of the work-relatedness of health problems might be helpful in identifying these determinants (14).

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