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Municipal occupational health services for small workplaces

Background and general methodology of the study

by MATTI TOLONEN, M.D.¹

TOLONEN, M. Municipal occupational health services for small workplaces: Background and general methodology of the study. *Scand. j. work environ. & health* 5 (1979): suppl. 2, 1—11. This paper deals with the new Occupational Health Service Act of Finland, as well as the background, scope and general methodology of a walk-through survey. The study comprised 163 small places of work within two municipal health center areas, and the primary objective was to determine their need for actual occupational health services. The workplaces were surveyed for a comprehensive picture of their physical and chemical hazards, as well as for knowledge of first-aid preparedness, need for job-related health counseling, personnel facilities, personal protection, and the required ergonomic and safety activities at the workplaces within the community. This ad-hoc information was considered essential for the planning of a nationwide occupational health program, and, more specifically, an assessment could be made of the utility of health personnel in reducing and preventing occupational health and safety risks at small places of work. More specific details of the sample and methodology are reported in other communications.

Key words: ergonomics, first aid, health examinations, municipal health centers, occupational health services, occupational hygiene, occupational nursing, occupational safety, personal safety items, personnel facilities, small enterprises, small industries.

A new occupational health act (743/78) was passed in Finland in the beginning of 1979. This act is what is called an "enabling act," which in effect supersedes existing legislation. It will gradually and progressively extend occupational health services to all of the working population by 1983, even to the self-employed, who are coming under statutory health protection for the first time. It will extend obli-

gations and protection to 60,000 small places of work employing 400,000 people never before served by this kind of legislation. The new legislation requires that the employer arrange necessary preventive job-related health services under the supervision of medical expertise. Furthermore, the act stipulates that the delivery of occupational health services requested by employers is an obligation of municipal health centers.

Conceptually and practically, community-based occupational health services differ from those of public health in that the concept of "occupational health services" is strictly work-related. Care for illnesses

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unrelated etiologically to work is not included in the employer's obligations: neither are aspects of public health since the Public Health Act of 1972 stipulates that the following are the responsibility of the community: (a) health guidance, including informational work in public health, counseling on contraception, and general health screening; (b) transportation facilities for patients, excluding the maintenance of special vehicles for difficult circumstances; and (c) dental care, including informational and preventive activities and the examination and treatment of students' health in the elementary, secondary, comprehensive, and vocational schools located within the community. During the preparation of the Act the following question arose: "What are then the required occupational health services and what is their feasible scope and application, particularly in small places of work?"

The Ministry of Health and Social Affairs requested a report on the implementation of the aforementioned law from the Institute of Occupational Health. This report was ready on 25 February 1976. During the preparation of the report, problems concerning small enterprises were faced. The need to survey and chart the unresolved questions was apparent. The planning of occupational health services for small enterprises needed systematic data, and this lack gave impetus to the project.

At the beginning of 1976 the Institute of Occupational Health initiated this project to evaluate the need for occupational health services in small industries, businesses, and other enterprises. The aim was also to determine the forms in which these services could be offered and the manner in which they should be organized in municipal health centers. The results should help the planning of a national occupational health program. Information was to be obtained on the need for medical and technical occupational health services and their necessary requirements.

Since one of the objectives of the project was the development of a health program which a local health center could provide for small and widely scattered companies, the study and procedures were designed from the viewpoint of the health center and its resources.

WORK FORCE AND SMALL ENTERPRISES

The total work force in Finland is 2.2 million, of which 0.4 million are self-employed (including 282,500 farmers).

Most Finnish enterprises are small (tables 1 and 2). Out of a total of 59,200 enterprises, 42,000 (71 %) employ four or fewer persons. Half (19,200) of these "mini" enterprises belong to the retail trade, one-quarter (9,440) to industry, and the rest (13,450) to other economic activities (1).

Industrial companies are mostly (85 %) small, 12 % being medium-sized and only 3 % large. The small industries employ about 19 % of the industrial work force, and the medium-sized nearly 22 %. About 12 % of the total work force is employed by the two (table 2).

The number of employees is crucial to the consideration of the arrangement of occupational health services. The medium-sized and large companies are able to organize in-plant occupational health programs, whereas the small ones have to rely on outside services.

In 1976 only 3,000 enterprises with less than 20 employees had arranged occupational health services. These services covered about 20,000 persons. Most of the services were delivered by the 200 municipal health centers set up according to the Public Health Act of 1972 (13).

OCCUPATIONAL HEALTH PRACTICE IN HEALTH CENTERS

About 200 health center districts have been formed within the 400 municipalities of Finland since 1972. Currently the health centers employ about 1,400 physicians and 3,000 public health nurses. The estimated annual increase is less than 100 physicians and about 30 nurses. Health center personnel also include dentists, nurses, medical aids, laboratory and X-ray technicians, physiotherapists, psychologists, administrators, secretaries, and auxiliary personnel.

Table 1. Number of enterprises required to pay purchase tax, and their number of establishments and personnel at the end of 1974, according to the number of employees.^a

Personnel per firm	Workplaces (N)		Personnel (%)	
	All activities	Industry	All activities	Industry
1—4	42,068	9,437	6	2
5—99	15,809	5,088	21	18
100—499	1,092	543	21	19
≥500	273	144	52	61
Total	59,241	15,212	100	100

^a Source: Enterprise Register of the Central Statistical Office of Finland.

Table 2. Number of industrial workplaces and their personnel at the end of 1974.^a

Personnel per firm	Firms		Establishments	
	Number	Percent	Number	Percent
≤ 19	2,303	46.9	2,921	43.2
20—49	1,286	26.1	1,716	25.3
50—99	590	12.0	917	13.5
100—199	367	7.5	619	9.1
200—499	222	4.5	416	6.1
500—999	67	1.4	126	1.9
≥1,000	82	1.6	59	0.9
Total	4,917	100.0	6,774	100.0

^a Source: Enterprise Register of the Central Statistical Office of Finland.

Today, the estimated shortage of occupational health physicians in municipal health centers is about 240 and that of occupational health nurses about 480.

The first 30 occupational health posts for physicians in the health centers were established in 1974 and filled the following year. Of the new posts for physicians and public health nurses established annually, a certain number are designed for occupational health.

At the end of June 1977 there were 173 occupational health physicians, 72 of whom work full-time. Occupational health nurses numbered 200 (150 full-time). Community-based occupational health services covered 200,000 persons (mostly employed by the community itself) and about 2,000 places of work. Potentially occupational

health services could cover an additional 600,000 employees, and over 60,000 places of work. The rest, about 1,000,000 persons and 20,000 places of work, are already covered by services of the private sector (12, 13).

At present the main occupational health service of the health centers is the provision of health examinations and health counseling. Occupational hygiene, ergonomics, and accident prevention have not received the attention they need. Full-time occupational health physicians and some of the part-time physicians have attended the two- or three-week basic course given by the Institute of Occupational Health. Most of the occupational health nurses have not received this type of additional training. Due to the lack of a national plan, training has often been sporadic.

DIRECTIVES OF THE NATIONAL BOARD OF HEALTH PERTINENT TO OCCUPATIONAL HEALTH SERVICES

During the survey the following directives concerning occupational health services were in force:

1. directive to municipalities concerning the arrangement of occupational health services in municipal health centers (4);
2. directive on the promotion of health counseling in municipal health centers (5);
3. directive on health examinations within occupational health services (6);
4. directive concerning priorities in the implementation of occupational health services in municipal health centers (10);
5. directive on the implementation of occupational health services in municipal health centers (7); and
6. directive on occupational health services in municipal health centers (9).

[In 1979 all but one (concerning health examinations) of the directives listed were replaced by two new directives (8, 11) issued in compliance with the new Occupational Health Act.]

General directive

The general directive, issued in 1972, contained the fundamentals for implementing occupational health services. In this context a brief recapitulation of the directives pertinent to this study follows.

Municipalities should begin the implementation of occupational health services by examining the area's needs for such services. First they should list the enterprises in the area, their nature of activity, and the number of employees. The need for occupational health services should be determined in a survey of the workplaces, and a written plan should be prepared regarding any special and urgent occupational health services and their arrangement.

A determination of the functions of occupational health services and an evaluation of the personnel resources required for such services should be made immediately following this basic report. The plan of action for occupational health services in the health center should be based on the need documented in the report.

Priority must be given to those companies with hazardous jobs and conditions. In the plan of action for a particular workplace the health center should specify the pertinent services and the arrangements for realization. These plans must be included within the health center's plan of action.

The agreement between the municipality and the employer must follow a formula which determines the scope of occupational health services as follows: (a) expertise and consultation in occupational hygiene, (b) preemployment medical examinations, (c) other health examinations including examinations required by labor protection legislation, and (d) other occupational health consultation required by the employer. This model formula, approved by the National Board of Health, should also determine the charges for the services. In principle the health center should charge the actual costs for the given services.

The directive stressed both visits to the work sites and health examinations.

Health examination directive

In 1974 the National Board of Health published instructions concerning health examinations made as an occupational health service. They do not concern preplacement and periodic examinations of workers exposed to specific occupational hazards; special regulations exist for these.

The health examination directive is not job-related at all; rather it was issued purely from the public health point of view. The examinations are restricted to those indicated medically, since, at the time the directive was issued, multichannel and other irrelevant screening examinations had become popular in the occupational health services organized by private companies.

Two types of examinations are recommended, a preemployment examination and a follow-up examination. It was anticipated that the municipal health centers would eventually provide adequate screening for health and that scientific knowledge about health examinations would improve. The National Board for Health realized at the time that revisions would eventually be needed.

Health counseling

The directive concerning health counseling in occupational health services focused on the prevention of cardiovascular disease, the improvement of dental health, and birth control. Among people of working age the prevention of cardiovascular disease, lung diseases, diseases of the musculoskeletal organs, and the prevention of accidents, as well as mental health in the place of work, were stressed.

The community has the general responsibility for health counseling and screening for health; however, employers are naturally obliged to provide health counseling related to risks on the job.

Priorities in the implementation of occupational health services

The National Board of Health has issued directives in several different connections to the effect that priority should be given to those enterprises with hazardous conditions and jobs. A specific list was prepared (23 June 1974) specifying such types of enterprises. In 1972 hazardous enterprises employed about 820,000 persons, 390,000 of whom were not covered by occupational health services.

[This directive is no longer valid because a new decision of the Council of State (1009/78) stipulates the timetable for extending occupational health services to all workplaces.]

Technical personnel

The National Board of Health has issued a directive (9 January 1974) concerning

the need for technical personnel within occupational health services. Such personnel are not to be employed at the municipal health centers; rather their services may be received through health technicians subordinate to the municipal board of health. The directive states that supplementary training in occupational hygiene is necessary, and communities are requested to participate in courses given by the Institute of Occupational Health.

EXPERT SERVICES FOR OCCUPATIONAL HEALTH

Between 1973 and 1976 a network of six regional institutes of occupational health was set up to ensure the delivery of occupational hygiene, ergonomic and medical advisory services. These institutes are situated in the cities of Helsinki, Kuopio, Lappeenranta, Oulu, Tampere, and Turku (fig. 1). They serve the enterprises and

Fig. 1. Regional institutes of occupational health, their operational districts and the location of the municipalities Oulainen and Tuusula.

their occupational health services directly and cooperate with the labor inspectorate and the provincial boards of health. The equipment and personnel resources of the regional institutes have been established to cope with any special demands for services within occupational medicine. Especially consultation for small workplaces has been taken into account.

There are also other expert institutes which deliver hygienic services, for example, the National Research Center.

SAFETY AT WORK AND LABOR INSPECTION

Mandatory cooperation in safety matters between the employer and the employees has been stipulated by law. The employer must appoint a safety supervisor, or officer, while the employees elect a safety representative. In all establishments with 20 or more employees, a safety committee is also to be elected. The responsibilities of these persons have been stipulated by law.

According to the Labor Protection Law (131/73) and Decree (954/73) workplaces are to be inspected as often and efficiently as to fulfill labor protection requirements. Those places of work in which particular risks to life, health and safety are found are to receive special inspection priority.

Administratively, the agency for labor inspection is divided into provincial and municipal bureaus. Provincial labor inspection covers companies with ten or more employees, as well as those companies having dangerous substances, equipment, or work processes.

Labor inspection was reorganized in 1972. Yet, e.g., in 1976 the inspections covered only 700,000 persons, i.e., 40 % of all employees. The inspections concentrate on hazardous workplaces; the uninspected establishments are probably also those which do not provide occupational health services.

In 1976 the labor inspectors wrote more than 120,000 notices to employers. Nevertheless, the volume of inspection was not considered sufficient by the National Board of Labor Protection.

For a comprehensive picture of labor protection and legislation the reader is referred to a review by the Ministry of Social Affairs and Health (3).

MATERIAL

Choice of sample areas

Two "typical" rural health center areas were selected as the study sites. Tuusula in southern Finland and Oulainen in the north represent average health center areas in many respects. Their population is about 15,000—20,000, and the work establishments, about 200—300 in number, are widely scattered. Both the municipal boards of health and the labor inspection bureaus also recommended these areas. Furthermore, the proximity of the areas to regional institutes of occupational health was advantageous. Finally, both communities had health centers with an occupational health unit ready to cope with the needs that might be elicited by the study.

The occupational health staff at the Tuusula Health Center included one part-time occupational health physician, two occupational health nurses, and one secretarial assistant. The Health Center served 20 companies through contract as well as the community itself. This coverage included 1,850 employees, 700 of which were municipal employees.

At the beginning of the project the Oulainen Health Center had no functioning occupational health services.

Sample

Places of work were selected from a complete list of firms provided by the municipal labor inspectors. A total of 509 companies existed in these two areas, 307 in Tuusula and 202 in Oulainen. They employed some 7,600 persons.

So that the results would yield valid data of special interest, the sample was stratified according to target groups. The sample size within each branch of eco-

conomic activity was determined by a priori knowledge and experience about the health and safety hazards in each branch. Accordingly, hazardous categories, e.g., industry, formed samples large enough to ensure that diverse, relevant risk factor groups would be included, whereas other,

nonhazardous branches, e.g., trade, formed smaller samples. This procedure resulted in a survey sample of 163 places of work employing 2,428 persons (table 3), and therefore 33 % of the firms and the work force was covered in the health center areas.

Table 3. Coverage of the survey. Workplaces and personnel in the municipalities of Tuusula and Oulainen.

Economic activity ^a	Workplaces		Personnel		
	Existing	Surveyed	Existing	Surveyed	Percent
Agriculture, hunting, forestry, fishing	8	3	158	60	38
Mining and quarrying	8	3	551	72	13
Manufacturing	104	59	2,712	1,254	46
Electricity, gas and water	7	4	109	26	24
Construction	33	5	284	49	17
Trade, restaurants and hotels	187	46	1,090	394	36
Transport, storage and communication	30	10	314	186	59
Financing, insurance, real estate and business services	33	6	170	81	48
Community, social and personal services	99	27	1,951	306	16
Total	509	163	7,339	2,428	33

^a Ranked according to the Standard Industrial Classification (SIC).

Table 4. Existing and surveyed workplaces in Tuusula and Oulainen according to the number of employees.

Economic activity ^a	Existing workplaces			Surveyed workplaces			Total
	< 9 employees	10–19 employees	≥ 20 employees	< 9 employees	10–19 employees	≥ 20 employees	
Agriculture, hunting, forestry, fishing	10	25	123	9	0	51	60
Mining and quarrying	8	48	495	3	14	55	72
Manufacturing	243	170	2,299	178	151	925	1,254
Electricity, gas and water	23	12	74	14	12		26
Construction	110	11	163	28	0	21	49
Financing, insurance, real estate and business services	540	213	337	143	111	140	394
Transport, storage and communication	78	68	168	22	23	141	186
Trade, restaurants and hotels	88	51	31	15	35	31	81
Community, social and personal services	234	133	1,584	71	59	176	306
Total	1,334	731	5,274	483	405	1,540	2,428

^a Ranked according to the Standard Industrial Classification (SIC).

The greater portion of the firms sampled were industrial ones, which employed nearly one-half of the industrial work force in the municipalities. The greatest part of all firms (77 %) employed less than 10 employees (table 4).

Companies with in-plant occupational health services were excluded from the survey. Also excluded were companies with more than 100 employees. Construction firms and foundries were excluded in as much as other recent studies have reported on their health problems.

Occupational accidents reported by the firms selected

The employers of the workplaces selected for study reported 256 accidents within the year 1976. Of these 187 had occurred in industry, 48 in service vocations, and 21 in other branches of economic activity. During the decade 1966—1976 22 occupational diseases occurred, all within industry. One was a case of noise-induced loss of hearing; the rest were dermatitis. Tables 5 and 6 illustrate the absenteeism due to work accidents and other causes.

SCOPE AND GENERAL METHODOLOGY OF THE SURVEY

The conceptual starting point of the survey was the following: It is difficult to protect a person against a risk that has not been properly recognized. Also it is known that the development of production techniques and the achievements of labor protection reduce and abolish risks to health and safety, but on the other hand new risks may appear. These changes determine the need for actual occupational health services at any place of work.

As a practical procedure, the regional institutes and the respective municipal authorities organized a joint informational meeting for the occupational health personnel, labor inspectors, chairmen of the pertinent employer associations, and the local press.

Then the project teams contacted the selected employers by letter. The study was described, and they were asked to participate. This policy met with no difficulty. (Only one firm refused, and a few had ceased production or had no employees.)

The employers were also told they

Table 5. Absenteeism due to work accidents in 1976 in the industrial, service and other workplaces surveyed.

SIC classification (major groups)	Absentee days	Employees	Absentee days per employee
Industry	1,643	1,254	1.3
Service	1,031	967	1.0
Other activities	300	207	1.4
Total	2,974	2,428	1.2

Table 6. Sickness absenteeism in 1976 in the industrial, service and other workplaces surveyed.

SIC classification (major groups)	Absentee days	Employees	Absentee days per employee
Industry	7,592	1,254	6.1
Service	3,276	967	3.4
Other activities	967	207	4.7
Total	11,835	2,428	4.9

would be given a written report summarizing the conditions in their enterprises and making recommendations for improvements. It was also explained that the study group would follow-up the possible changes made.

The employers were also asked to select a contact person with whom arrangements for the visit could be made.

Environmental survey

The work conditions were evaluated during the visit to the firms. The following items were observed: first-aid preparedness; personnel facilities; job-related health counseling; personal safety items and protective clothing; ergonomics; occupational hygiene; and occupational safety.

A questionnaire was prepared by the study group and pretested in ten establishments before the start of the survey phase. The questionnaire, accompanied by another letter as a reminder of the purpose of the study, was sent to the employer two to three weeks before the ensuing visit. The employer was asked to complete the form before the visit in order to insure enough time for listing the possible risk factors, even those not prevalent at the moment. One purpose of the questionnaire was to save time and to enhance the preparedness of the investigators during the visits. It also provided some assurance that no pertinent hazards would be overlooked by the investigators.

The time for the visit was arranged in advance with the contact person. At the beginning of the visit, the occupational health nurse collected the questionnaire. In half of the cases it had not been filled out, and the occupational health nurse, who interviewed the employer or the contact person, became responsible for completing it. Later the other investigators gathered supplementary information in order to make the data as accurate as possible. Every member of the research team evaluated the work conditions pertinent to his or her expertise.

The occupational health nurses and the physiotherapists examined all the selected establishments, whereas the technical groups, i.e., the occupational hygienists and the safety engineers, went only to

places of work where relevant hazards were to be expected. A screening of the firms by the occupational health nurses and the physiotherapists was considered sufficient. An alarm system was agreed upon however; the occupational health nurses would notify the doctors, hygienists, and engineers whenever the need arose. The teams in Tuusula and Oulainen made preliminary visits to ten places of work, assessed the work conditions, and then discussed and agreed upon the evaluation criteria to be employed.

Despite advance notification, a hazardous job was not always present, and certain establishments had to be revisited. No evidence of disassembling was found at any establishment. On the contrary, the hazardous phases of jobs were even demonstrated upon request, e.g. painters sprayed an item so that the solvent or dust concentrations could be measured.

Only workers in the production areas were included in the numbers of persons exposed to physical, chemical, and safety hazards.

Once the preliminary interview was completed, the investigators proceeded with the survey of hazards. General evaluations were based upon subjective judgement, and environmental measurements were made with direct indicators. Complementary measurements and analyses were conducted later if considered necessary for recommending a change in the work environment or for the assessment of the need for periodic health examinations. The number of workers exposed to specific physical and chemical hazards was recorded.

The study teams tried to obtain information on all tasks, including those of a temporary nature and even those not presently being performed. The workers were interviewed concerning exposure and their tasks, the duration of each exposure, and the number of repetitions per day, week, month, or year. Whenever many employees were doing the same task, only a few were asked to discuss their jobs in detail.

The degree of confidence in the results was increased by the fact that the hazardous places of work were visited at least twice by different members of the team and those workers exposed to specific hazards were interviewed several times.

For instance both the hygienists and the occupational health nurses checked safety items, observed their use, and discussed their care and maintenance.

Wherever the occupational hygienists found exposure to lead, blood lead samples of all exposed persons were available.

The investigators visited two to three small places of work per day, three days a week.

Method for scoring

Both research teams, one in Tuusula and the other in Oulainen, used the same criteria in evaluating work conditions, strain and exposure. An evaluation of safety and health hazards was based on information gathered beforehand, observations, and measurements. The work sites were described by a numerical score. The following factors determined the score: nature (quality) of health/safety hazards, strength (amount) of health/safety hazards, and exposure time (hours per shift, days per week, days per month, months per year, etc.).

The base line for scoring was compliance with legal regulations and other generally accepted guidelines and recommendations and, where these did not exist, the personal experience of the investigator.

The score was 0, 0.2, 0.5, 0.8, and 1. Zero indicated total agreement with the regulations. The score 0.2 indicated minor deviation, 0.5 intermediate, and 0.8 substantial deviation. A score of 1 indicated an unacceptable situation. Details are discussed in the reports of the different phases of the study.

General remarks on a walk-through method

The need for occupational health services depends on the nature of the job and related risks. From a theoretical point of view, a complete evaluation of all hazards to health and safety could be considered impossible. A simple, easy, and fast method, though desirable, is non-existent. In the planning of this survey the following aspects were taken into consideration:

1. All hazards to health and safety are not known. An accident may occur in a place looking completely safe. The health effects of many physical, chemical, biological, and psychological factors are not fully known. New dangers appear, e.g., new chemical compounds are continually being introduced.

2. There is no science without measurement. Observation through the senses increases the possibility for error. Measurement of some safety and health hazards, such as quartz dust, are cumbersome and expensive or difficult. Many factors cannot at present be measured at all because a reliable method is lacking (e.g., risk of an accident, some carcinogenic substances).

3. The basis for comparison is relative and uncertain or may be completely lacking. For example, attempts to create international, generally accepted threshold limit values for airborne contaminants have failed. Different countries apply different labor protection norms and recommendations. On the other hand some hazards have norms in preparation.

4. An objective picture of the workplace is made difficult in that, among other things, workers of different personality react differently to their jobs and work environment. One is troubled by certain factors, while another is not. This phenomenon applies to safety, ergonomics, hygiene, as well as psychological factors.

5. Both the labor protection norms and the workers' subjective criteria reflect ideas about work conditions prevalent in their own time.

6. The jobs and workers, as well as the work environment, often change, especially in small workplaces.

A walk-through survey gave a glimpse of the work situation. In this study it could be completed by interviews and demonstrations and repeated visits to the workplaces. Yet it was difficult to create a coherent picture of all jobs.

The methodological limitations pertain mainly to manufacturing plants, which comprised only one-fifth of all the work-

places surveyed. These were investigated by all five members of both teams, who made evaluations of hazards pertinent to their own expertise. These methodological limitations seem insignificant from the practical point of view of the objectives of the project.

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