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Arrangement of municipal occupational health services for small workplaces

Conclusions of a survey of 163 small workplaces

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

The planning and implementation of occupational health services for small companies and businesses as a function of municipal health centers could be approached only through a methodical acquisition of relevant data from those small work establishments comprising the potential clientele (2). This ad hoc problem formulation did not require a study design yielding results independent of time and place because the most important question to be answered was: "What relevant health-related problems can be found and reduced or eliminated through the arrangement of occupational health services?"

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The results of this study must not be generalized to health centers at large; instead the application of our experience would require a consideration of a number of variables that cannot be reduced to simple formulas. Needless to say, the services needed and the strategy suitable for their implementation and maintenance in any particular health center area depend on local circumstances, for instance, the work force, the economic structure of the area, and, ultimately the recognized work conditions and the on-going and intended technological changes at particularly hazardous work sites. In the present study the most important aspect of the sampling of the work establishments was to insure an accumulation of knowledge that would fulfill the goal of the study. The problem was clearly one to be studied at the community and area level rather than in isolated divisions of economic activity. Therefore the sampling did not require

representative strata within the various economic branches.

The health center areas selected contained a total of 35,000 inhabitants and a work force of nearly 8,000 persons employed by 500 different companies and businesses (2).

Crucial was a comprehensive picture of the required occupational health services as a whole for the firms surveyed. A posteriori we may state that the study yielded information useful for the planning of occupational health services in health centers in general.

Moreover, the analytical phase revealed that the results could also be scrutinized with respect to three broad economic categories, i.e., industrial, service and other places of work. Hence, the results may be used at least as guidelines for the planning of occupational health services for small work establishments belonging to these groups.

RISKS TO SAFETY, HEALTH AND WELFARE AT WORK

A comparison of the work conditions at 163 work establishments with the regulations, instructions, recommendations and other prevailing labor protection requirements revealed the following types of faults and defects at all places of work: (a) risk of injury; (b) noise and other harmful physical factors; (c) exposure to chemical substances; (d) lacking or inadequate protection against risks; (e) lack of necessary supplementary aids, e.g., in lifting and carrying; (f) bad work postures; (g) inadequate first-aid preparedness; and (h) failure to provide such information, instruction, training and supervision as was necessary to insure the health, safety and welfare of the employees at work. These faults and defects have been grouped into the following four broad categories for discussion: (a) risks of occupational accidents or diseases, (b) overloading of the

musculoskeletal system, (c) failures to provide adequate personnel facilities, (d) failures to comply with the personal responsibility imposed on directors, managers and companies, in respect to conditions which are not imperiling the health of the employees. The last two categories also include conditions possibly causing nuisance and other situations in which a recommendation could be made for improvement although no violation of the rules or other omission was found. (Psychological aspects were not included in this study.)

Risks of occupational accidents and diseases

The survey covered 163 workplaces and 2,400 employees (3). In 1976 some 250 accidents were reported; but in 1967 through 1976 only 22 compensable occupational diseases occurred (21 cases of dermatitis and 1 case of noise-induced hearing loss). These are not absolutely dependable results, but they clearly illustrate the relative frequency of accidents and occupational diseases.

The number of reported work accidents and occupational diseases concurred with their generally known incidence. In Finland the annual rate of work accidents is about 200,000 and that of occupational diseases 5,000. In 1976 dangerous substances caused 1,569 recorded cases of occupational dermatitis and 405 cases of other occupational diseases (8). Most of them occurred in medium-sized or large companies which had their own in-plant occupational health services. However, even if they all would have occurred in small work establishments, potentially associated with occupational health services provided by a health center, there would have been an average of only eight cases of dermatitis and two other occupational diseases per health center. Even though this is merely a theoretical calculation, it seems likely that occupational diseases can be anticipated to be rather rare at the municipal health center level. In this respect, the places of work selected for study seemed to represent a typical potential health center clientele fairly well.

The safety survey revealed 84 plants, most of which were regarded in advance as hazardous, with one or more vital safety risk in the work environment (2). The work environment had, indeed, been attributed as a causal factor in one-third of the work accidents reported from these particular places of work. Materials handling was potentially unsafe in half of these firms. Some 700 technical machines or equipment were reported to involve a potential risk to safety. One-third of these risks were regarded as substantial or great. Protection from these machines and other equipment did not comply with the rules. Thus, the environmental survey revealed safety hazards, as could be expected on the basis of the data collected from these plants prior to the survey.

There is no simple answer to the question of how many workers were exposed to the risk of accident. First, particularly dangerous situations are ones that appear to be relatively safe, and second even obviously dangerous situations vary from time to time, and many different persons may eventually use dangerous machines and equipment. Of course, the employees directly engaged with production in industrial workshops were exposed to the greatest risk. Thus the problem of safety is closely allied with the problem of productivity.

The risk of occupational diseases may be estimated against the results of the occupational hygiene survey. In advance hygienists' visits were considered necessary for 99 of the 163 work establishments (1). It was found however that in a few of them an occupational health nurse's visit would have sufficed, for, as in the other 64 firms, no particular hygienic problems were noted. The 99 workplaces surveyed by the hygienists employed 1,715 persons, most of whom worked under normal, safe and healthy conditions. With respect to the prevention of occupational diseases, the most common single hazard was noise. One-fifth of the people surveyed and one-fourth of those employed by the companies included in the hygienic survey were exposed to noise. About 70 men were exposed to potentially harmful vibration.

The most common exposures to dangerous chemical substances where those involving allergenic agents, solvents and oil mist. About 25 % of all the persons surveyed handled, at least periodically, allergenic, toxic or carcinogenic substances, and hence preventive measures were in order. These exposures occurred mostly at those establishments which were classified as hazardous in advance. As expected, the most frequent hazards were those apparently trivial ones which do no more than interfere with comfort and work efficiency.

About 20 % of the 2,400 employees where exposed to hazards to such a degree that periodic health examinations were required.

The fact that many small enterprises are in need of outside expert advice is indicated by the following: Noise combatment was recommended in 63 firms (out of 163), improvement of lighting conditions in 43, thermal conditions in 22, and control of vibration in 20. Exposure to solvents should be controlled in 24 workshops, exposure to organic dusts in 17, and exposure to toxic metals in 10. In practice, most of the omissions noted did not directly imperil anyone's safety and health, for example, violations of first-aid regulations, information and instruction of the workers, and arrangements for cooperation in safety matters.

Musculoskeletal strain

The ergonomic survey of the 163 workplaces revealed some faults and defects giving rise to musculoskeletal strain (9). From the point of view of health, the most significant findings were poor lifting conditions (29 % of all lifting work). The heaviest weights lifted off the ground exceeded the recommendations of the International Labor Organization in 16 % of the lifting work sites.

Bad work postures, tools, and equipment also caused musculoskeletal strain in certain jobs. Yet, the adverse effects on health was relatively minor since most of these jobs were short-time and varying as a rule. In general the ergonomic problems noted mostly caused no more than temporary musculoskeletal strain.

Failure to provide adequate welfare and comfort facilities at work

The occupational hygiene and ergonomic survey of many establishments resulted in recommendations for rearrangements even though there were no apparent risks to safety and health. Examples of faults and defects creating a nuisance in the work environment and found not to comply with the employer's liability were, for instance, poor illumination, disturbing noise, draft, uncomfortable temperature, irritating airborne contaminants, and minor ergonomic problems. These observations speak for themselves. Nuisance, for example, only becomes a legal matter if it goes beyond that which the ordinary, sensible person would expect to put up with. ("Welfare" in this context does not cover financial welfare — pensions and other fringe benefits. Neither is a medical examination considered as "welfare" in this report.)

Other observable infractions or negligence of the rules

A thorough survey of the workplaces revealed many breaches and considerable negligence of labor protection rules which, however, neither imperiled worker safety and health nor created any particular nuisance. Such things were, for instance, inadequate first-aid preparedness; insufficient provision of such information, instruction, training and supervision of the workmen as is stipulated as the personal liability of the employer; and cramped personnel facilities, for example, poor lavatories (4, 5, 6, 7).

THE ROLE OF HEALTH CENTER PERSONNEL IN COMPARISON WITH OTHER PARTICIPANTS IN THE DETECTION AND CONTROLLING OF HAZARDS CAUSING INJURY AND DISEASE

The Labor Safety Law requires every employer to insure, as far as is reasonably practicable, the health, safety and welfare

of all his employees at work. This duty includes steps to correct the faults and defects detected in the work establishment. The manager or the executive has the ultimate responsibility for what happens in his firm. He cannot leave that to outside specialists, who are just that — outside specialists in one area, health care.

Now the question arises as to which aspects, what extent, and the frequency with which employers need the help and expertise of persons outside the firm in fulfilling their duties. The duties of the labor inspectors are well defined, and the recent efficiency of labor inspection has been discussed elsewhere (2). From this study it is evident that in small work establishments many employers are not only insufficiently aware of their duties, but they also seem to need expertise from outside to help them discover and assess certain occupational safety and health problems and to aid with the planning of control measures. In some cases, follow-up of the remaining health hazards requires outside expertise, too.

In this context the straightforward question arises concerning the competency and practical possibilities of the medical staff of a health center consulting (and charging) an employer on occupational safety and health matters.

Measures to be taken by the employer and management (generally as an internal affair of the firm)

The following list contains examples of obligations imposed on the employer personally: (a) establishment of a safety committee and other cooperation between the employer and employees required by law; (b) establishment of systematic instruction, training and information of workers, particularly new employees; (c) provision of proper safety devices, motivation and supervision of their proper use, maintenance and storage; (d) establishment of first-aid preparedness, including training and equipment as required by the rules; (e) maintenance of personnel facilities; and (f) reduction of the risk of injury by creating better plant order and work systems with more effective cleaning procedures and arrangements insuring safety in con-

nection with the use, handling, storage and transportation of articles and substances and the establishment of other simple everyday safety practices within the place of work.

Outside nonmedical expertise needed by the employer

Employers require outside nonmedical expertise with respect to the following problems: (a) a part of the safety problems, particularly those requiring special know-how about safety techniques and safety items; (b) hygienic problems requiring an estimation of the need for measurements, interpretation of their results, and recommendations concerning alternative control principles and practical solutions; and (c) selection and acquisition of appropriate personal protective equipment and other safety items.

Topics within the realm of occupational health care

The survey revealed the following problems within the purview of health personnel: (a) evaluation of the need for medical examinations of the employees and possible preliminary examinations (e.g., those for lead exposure in this project); (b) performance of the required medical examinations; (c) evaluation and follow-up of the health effect of certain occupational hygiene and ergonomic problems, (d) provision of information to the management and workers about possible risks to safety and health, as well as instructions concerning protection against these risks in as far as they belong to the domain of medical expertise; and (e) provision of information to the employer and management about required first-aid preparedness and possible coordination of the necessary training and other functions (e.g., catastrophe exercises, etc.). Some of these topics require special expertise in occupational medicine, toxicology, ergonomics and rescue operations, while others require medical consultation which may be given by the health center personnel without any outside help.

Many of the consultations requiring medical expertise at the work site are non-recurrent or rarely require follow-up or repetition, for example, supplying of first-aiders; selection of the employee responsible for checking the first-aid equipment; preliminary medical examinations; and consultations with occupational hygiene and ergonomic experts.

Very few conditions at a workplace are likely to require continuous medical surveillance. Those noted were periodic medical examinations and medical alertness to possible new occupational health problems.

As already indicated, the need for strictly medical expertise at most of the work establishments surveyed was limited or nonexistent. Generally, preventive occupational health care was required only for the prevention of occupational diseases, ergonomics and the setting up of first-aid preparedness in accordance with the rules. Moreover, health counseling seems warranted for workers in jobs with special health requirements. Failures and negligence in labor protection seldom fall primarily within the domain of health care. Even those functions requiring medical consultation should be put into operation in close collaboration with the safety personnel of the company and the labor inspectorate.

Finally, it should be kept in mind that occupational health personnel of the health center, through agreement between the municipality and the employer, do not represent the health authority, but merely an advisory service.

ARRANGEMENTS FOR OCCUPATIONAL HEALTH

Within the presented framework, the following guidelines can be offered.

Collection of background data

Occupational health practice of any health center should be based on a written plan taking the following items into consideration: (a) the companies and businesses within the area (existing, future and those

to be closed); (b) prevailing occupational health services (private and community sectors) and the need for their development; (c) perceived hazards to health and safety at work establishments and the anticipated role of health center personnel in their identification, evaluation, control and follow-up, as well as the need for medical expertise in informing the management and the exposed workers about protection against risks; (d) the need to maintain medical services after the survey and primary prevention phase; (e) the likelihood of the occurrence of new or unknown health hazards and the respective medical services needed; (f) the personnel, equipment, buildings, and financial resources required for occupational health services; (g) arrangements for the postgraduate education of occupational health personnel; and (h) required expert consultations and their possibilities for realization.

A list of firms within a health center area is usually kept by the municipal labor inspector. Additional information may be gathered from the municipal commercial officer and the local business association. The number of persons employed by the firms is indicated in the list of the municipal labor inspector.

In the planning phase of occupational health services, health personnel should require up-to-date information. In our survey it became evident that, because of rapid economic changes, data became quickly outdated. Yet, the acquisition of up-to-date names and addresses, etc., of existing firms and the number of their personnel is not an overly cumbersome task.

It is obvious that an effective occupational health program cannot remain static. The employers' need for medical consultation varies from time to time within a health center area. As recognized hazards are controlled and as new processes and materials appear, such programs must be constantly revised.

The need for medical consultations within any particular company or business also changes with time. Later visits to the work establishments or information gathered otherwise (e.g., from the labor inspectorate) may indicate that the firm's initial occupational health plan should be revised.

Survey of workplaces

During our project an occupational health nurse surveyed 100 companies and businesses in five months. This work included a general, overall survey, as well as a more specific evaluation of first-aid preparedness, personnel protection, the need for health counseling, and personnel facilities. On the average this task took 2 h or so per firm. The occupational health nurse spent more time, half a workday or even longer in hazardous enterprises, while small offices, shops, snack bars, etc., were surveyed rather quickly. These calculations did not include the time needed to travel from one firm to another.

A visit by a physician or other experts at a work establishment was indicated for specific reasons only, and these reasons became evident during the visits of the occupational health nurses. Therefore, a health center occupational health nurse should be able to make a relatively rapid survey alone, particularly of all those firms with no known specific health hazards. She also should be able to visit and survey the hazardous companies alone although supplementary visits by an expert may be required later on. As in this study, the occupational health nurse may well alert an expert to visit selected work sites, and hence the time of a qualified expert would not be wasted.

In general, the basic workplace survey made by an occupational health nurse should be regarded as a screening procedure, which is then followed by efficient activity at hazardous or suspectedly hazardous work sites. In some cases, the occupational health nurse may, already in connection with her basic survey or in the following written report, give advice on the protection of workers' health against any noted hazards whenever she has the proper alternatives for a solution. In other cases she should consult with the physician responsible for the occupational health services of the health center or the physiotherapist (as regards certain ergonomic problems) or the regional institute of occupational health. The occupational health nurse or the physician may also advise the employer to contact the regional institute directly with regard to, for example, specific occupational hygiene risks.

The health center personnel should invite an expert to join in the assessment of problem work sites. Even when health personnel are skilled enough to obtain a measurement of a physical or chemical hazard, it in itself has little meaning unless they are able to evaluate the results correctly and make recommendations that would correct or remove a problem. Inviting an expert seems to us the best way of insuring the adequate evaluation of the hazard, proper supplementary measurements, and proposals for alternative practical solutions. Consultation with experts with a technological background helps to avoid an unnecessary health service load, too.

Additional supplementary activities at a place of work may, in certain work sites, include the following: (a) an ergonomic investigation, (b) a safety inspection, (c) an occupational hygiene survey and related measurements, (d) an inspection of the need for personal protection and of the provided safety items, and (e) consultation about rearrangements at the workplace, e.g., redesign of jobs.

Faults in first-aid preparedness and needs for health counseling should also be recorded by the occupational health nurse. Corrective measures and possible follow-up may be planned after the basic screening survey.

The completion of a comprehensive survey should then lead to a health center plan of action which includes information on the personnel and other resources required for the maintenance of a future occupational health program.

Manpower considerations

One of the major problems confronting the planners of a nationwide occupational health program has been the uncertainty about the number of qualified occupational health professionals needed to carry out efficiently the mandates of the proposed law. As a matter of fact, their actual need in health centers has never been studied; instead moot estimates have been made from in-plant practices of industrial plants. Yet, the required activities for small businesses are somewhat different, as illustrated by this project.

Our survey made it unmistakably clear that an occupational health program at a health center should involve two separate phases, both requiring manpower considerations. First, as a key step, a survey of the potential clientele is needed which attempts to identify and quantify the health hazards, as well as the population at risk. Second, after collecting the necessary information, the health specialists should consider the need and kind of preventive health care that will be needed in spite of the engineering and other safety measures. It is these considerations that should result in a plan of action both for a workplace and the health center. The plan should include a written policy statement describing the purpose and objectives of, and the manpower needed to implement and maintain, the occupational health program. (In addition, a more-detailed description of the annual program for every firm is desirable in that it can also serve as instructions to the proprietor and the employees on the use of the services under different circumstances.)

This two-step approach, including the identification of workplace hazards relative to the population at risk, is linked directly with the need for occupational health personnel and the intelligent utility of their talents and resources. Such assessment, at least in some reliable manner, is necessary, if feasible and effective occupational health services for small workplaces are to be established eventually within municipal health centers.

Obviously both occupational health physicians and nurses are required for the delivery of adequate occupational health services by municipal health centers. Moreover, physiotherapists especially trained in ergonomics may be consulted for certain problem work sites.

In contrast, permanent posts for hygienists or safety engineers are not required because of the small amount of work, particularly in the long range. Moreover, the required expertise of the greatest advantage is available without any difficulty at the regional institutes of occupational health.

From this project one might expect that an occupational health unit including one physician and one or two nurses, provid-

ing that they draw on the technological and medical expertise at their disposal, should, within one year, be able to survey many small companies and businesses and to determine the requirements for occupational health services.

In this context we did not actually assess the number of health personnel necessary for the maintenance of constant preventive occupational health care in the firms surveyed, but obviously the practical need would be relatively small. The required resources may be at least roughly estimated with respect to health examinations. In our study the greatest need for such examinations was for hearing tests which, in most cases, should be given every third year to persons exposed to noise. The audiometric examinations may be carried out at health centers by especially trained technicians and not necessarily by the occupational health personnel; they only interpret the results and make the recommendations as regards exposure. Exposure to chemical hazards in small firms requires periodic health examinations rather infrequently. Preemployment medical examinations are required to a slightly greater extent, but be it as it may the health examinations of persons lacking symptoms are not likely to require many health professionals — one occupational health nurse is usually sufficient for performing about 1,000 health examinations a year.

Furthermore, the occupational health program to be maintained includes job-related health counseling and information for the proprietor, the lower management, and even the newest and least experienced employee, as well as the examination of symptoms suspected as work-related and certain psychological and other preventive measures. These activities, often referred to as "occupational health nursing," focus in general on small business as a whole or on work sites perceived as hazardous or on the persons employed there. In fact even in the hazardous companies the number of persons needing individual job-related health care seems to be limited.

Whenever a new company is established that possibly involves special occupational hygiene hazards and the company wants to enlist the aid of the occupational health services of a municipal health center, the

regional institute of occupational health should be consulted.

Also extraordinary health hazards may appear in the health center area, but then a research institute is often involved. Scientific problems are not likely to be included within the ordinary routine of municipal occupational health services.

As a result, this project warrants the estimation that after a professional primary survey, resulting in reasonable engineering control of the hazards, one occupational health physician is likely to suffice for thousands of employees; in other words, for the total work force of all small businesses within an average health center area. A physician's consultations are needed relatively infrequently, particularly, since a great part of the preventive functions to be delivered as a matter of routine belong within the framework of occupational health nursing. The need, of course, depends on the type of firm and on how sophisticated the proprietors and the supervisors are, and how extensive the methods of control are. Anyway it seems to us that two effective occupational health nurses could adequately serve all small businesses within an average health center area. (It is once again emphasized, particularly for a foreign reader, that in this context occupational health services do not include curative medicine at all.)

Later these manpower estimates may become more accurate, i.e., when and if the health centers apply these principles in practice.

POSTGRADUATE TRAINING OF OCCUPATIONAL HEALTH PERSONNEL IN MUNICIPAL HEALTH CENTERS

The aspects relevant to occupational health and safety belong to various areas of expertise, and no one person is fully competent in all of these areas. Some of the problems require medical expertise, whereas others are clearly outside the field of medicine and need the attention of other professionals.

Because of the complexity of the problems anticipated in municipal occupational health services, the situation differs considerably from that of a plant physician and his staff. First, the health center personnel may have to cope with a myriad of health problems, as revealed by this project, whereas a plant physician usually faces only a few occupational hazards. Second, the plant health personnel often have the opportunity of becoming experienced and skilled in their particular health hazard, while health center personnel, in so far as they are outsiders, often lack this opportunity and, as stated before, may have many different kinds of problems to cope with.

As regards postgraduate training of health center personnel, it is therefore desirable to construct an overall conceptual framework into which the various facets of occupational health practice can be fitted. This structure enables the health personnel to develop a realistic attitude and to perceive its contribution within the total context and also makes omissions in their training programs easier to detect.

Admittedly, the past and present undergraduate training of both physicians and public health nurses provides inadequate theoretical and practical skills to cope with the problems revealed by this study, and, accordingly, those likely to be met in occupational health practice at a municipal health center. Therefore, the planning of postgraduate training for occupational health personnel in municipal health centers deserves special attention.

In general terms, the role of health personnel as external consultants to the different companies has already been dealt with. The highlights of the required postgraduate education can be seen partly from these considerations. It is evident that health personnel should be trained in such a way that they become qualified as occupational health specialists. They must be knowledgeable and sometimes involved in "technical occupational health services," and then it becomes imperative to have sufficient understanding of occupational safety and accident prevention, as well as occupational hygiene and ergonomics. But health personnel cannot be regarded as experts in technology simply on the grounds of their training, because a

postgraduate course alone is inadequate to insure competent performance as an occupational hygienist, ergonomist or safety engineer. We would recommend caution with respect to contemporary putative emphasis on the effects of occupational health care.

Because of the basic differences in concepts and traditional academic separation, it does not seem sensible to arrange highly specialized, extensive training for medical personnel in technology, especially since, on one hand, scarcely any training facilities exist and, on the other, the required technological professionals are already available. Therefore, for problems with a technological nature it seems appropriate to recommend consultation with the regional institutes of occupational health rather than attempts to train medical personnel to become specialists in technology.

Even if the postgraduate training program tried to cover the relevant aspects thoroughly, maintenance of the skill creates obvious difficulties, especially in rare and specific matters. Therefore it seems reasonable to recommend consultation with the regional institutes of occupational health whenever such problems arise.

Apparently short intense courses should be considered, together with refresher courses for both physicians and nurses. Such training has already been provided sporadically for health center personnel by the Institute of Occupational Health. But if appropriate occupational health services are to be effectively established and maintained, a regular training program is necessary for the occupational health personnel of municipal health centers.

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