

OCCUPATIONAL HEALTH POLICY

PROGRAMME OF OCCUPATIONAL HEALTH RESEARCH IN POLAND (1986—1990)

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Abstract. The tendency to modification of the system for planning and coordinating research programmes in Poland resulted in establishing centrally coordinated programmes which are preferable in financial terms. Out of the total number of 100 such programmes, 6 concern medical science including 1 programme devoted to occupational health. The outcomes of the latter project include reliable evaluation of the working environment in the national economy, determination of a relationship between working conditions and industrial workers' health as well as preparation and implementation of effective preventive measures. The following activities were regarded as priorities whose implementation may directly contribute to more effective prevention and health care for industrial workers.

1. Developing and testing new methods for early detection of health impairments before the manifestation of clinical pathology and transient or permanent work incapability. 2. Developing and implementing methods for the selection of people oversensitive to certain environmental agents, in order to prevent unforeseen health effects of occupational exposure. 3. Determining and testing the conditions which may contribute to more effective PHC for workers covered by the industrial health service. 4. Developing and testing, under model conditions, the organizational and functional principles of PHC, with special regard to preventive measures for small factory workers who are not covered by the industrial health care. 5. Developing more effective system for the rehabilitation of the disabled, particularly as regards occupational rehabilitation at modified workposts in ordinary establishments.

In 1986, in Poland the system of financing and coordination of research was changed. The Government, searching for the means to advance the social and economic development of this country, selected more than 100 research programmes to be financed directly from the state budget. Most of the so-called central research programmes concerned techniques and technology but there were also 6 medical programmes (one of them concerning occupational medicine, financed by the Ministry of Health and Social Care for the last 10 years). The coordi-

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nating unit, i.e. the Nofer's Institute of Occupational Medicine in Lodz, trying to change the range of the programme had to fulfil the following conditions:

- development of programme assumptions basing on the evaluation of hygienic situation in plants, health situation of national economy workers and modern trends of occupational medicine development,
- determining priority lines of research,
- preparing an implementation plan of the programme so that during and after the 5-year planning period, a large part of the results of research in the form of new methods for occupational exposure assessment, early diagnostics of occupational diseases, model solutions concerning exposure monitoring or prevention systems, etc., could be used in practice in health care.

It is obviously very difficult to present all this material now. Briefly speaking, it may be ascertained that working conditions, especially in industry and construction, in spite of the previous efforts, still create the risk of health impairments. Noise, vibration, asbestos, industrial dusts containing crystalline silica, cadmium, lead, mercury, manganese, arsenic, carbon disulphide, paint and varnish solvents, carcinogens and some kinds of work characterized by a particularly high static or emotional load, are the main causes of occupational and work-related diseases. The number of diagnosed cases of occupational diseases remains unaltered, amounting to 8000. The overmortality of men aged 45—55 increased by about 40% in 10 years and in the structure of sickness absenteeism an increase in diseases of the circulatory system, locomotor organs, nervous systems and psychic diseases cases can be observed.

Several critical comments can be made with regard to the monitoring of working conditions, health and preventive care provided for industrial workers. In spite of high costs of maintaining these services their activity is considered to be not sufficiently efficient and their methods frequently far from up-to-date achievements and possibilities.

The world programme for occupational health, "Worker's Health", adopted by WHO for the years 1984—1989, was the rationale for the national programme of providing health care for the working population, and for the verification of the up-to-date research lines. Among others, the following theses of the WHO programme proved to be particularly useful:

Thesis I. Owing to the fact that the working population is the main productive force, the national systems of health care should be chiefly focused on providing health care for the producers of the national income. The working population constitutes a large and important part

of the society and its health is a significant element in a social and economic development of each country.

Thesis II. The development of the programmes for the health care of the population's productive groups should be an integral part of health service infrastructure and the coordination of the activities of various national bodies and institutions — directly or indirectly interested in the working population's health — should be ensured, including work, industry and other sectors of the national economy.

Thesis III. Approaches and technologies applied in occupational health care should also be implanted in the primary health service. Workers should participate more actively in creating the system aimed at providing health care for them and in its functioning.

Thesis IV. The following problems should be included in the constructed programmes for health care:

- diagnosis and monitoring of occupational diseases,
- identification and monitoring of noxious occupational psychosocial factors,
- assessment of neurobehavioural changes in health status induced by occupational exposure, aimed at finding out the causes of the increasing number of nervous system and psychic diseases cases.

It may be presumed that the Government's decision to provide full financial support for the programme from the state budget, was due to the following achievements of the previous 10-year period when it had been carried out as one of the 16 programmes partly subsidized by the Ministry of Health and Social Care and directly by industry:

1. The previously implemented and improved monitoring of individual X-ray doses (monthly, quarterly, yearly, multiple doses) of industry workers and persons operating X-ray units, has lately caused a considerable lowering of exposure: 98% of occupationally exposed persons receive less than 1/10 of the allowable dose.

2. Owing to the previously developed methodology of the assessment of individual exposure to radon and its daughters and the implemented system of the organization of measurements of the exposure value of metal ore, miners' exposure decreased by 1 order of magnitude and more than a 3-fold decrease in the risk of lung cancer was observed. Having received the results of measurements, mining industry authorities, without any administrative pressures, modernized ventilation systems in the hazardous headings in mines until an evident lowering of occupational exposure was achieved.



3. The occupational hygiene section of the State Sanitary Inspectorate uses the methods of the determinations of toxic substances concentrations in the air developed within the programme. 80 new methods of determination were implemented and more than 180 methods for the determination of toxic substances placed on the MAC list were verified. This included also 30 methods for the separate determination of multi-component mixtures of toxic substances occurring together in work-rooms (such as: metals solvents, isocyanates and amines derivatives, acrylates and other mixtures). The developed methods make the monitoring of exposure to toxic substances in industry, transport and construction possible.

4. The methodology of measurements was developed and a whole system of monitoring of industry and radiotelecommunications workers' exposure to electromagnetic fields was organized, covering 1/3 of the country. The State Sanitary Inspectorate and other supervising units were given the recommendations concerning measurement procedures, the method of interpretation and assessment standards. Owing to constant monitoring, dangerous zones were eliminated from workposts exposed to electromagnetic fields by getting rid of the unprotected devices and using shields.

5. A permanent system of computer registration and analysis of occupational diseases was introduced in Poland enabling discovery of the causes of these diseases, verification of diagnosis and control of the effectiveness of epidemiological studies. The conclusions drawn from the analysis enable central units and industry to undertake concrete preventive measures.

6. A permanent system of a complex analysis of the structure of temporary disability to work, covering all nationalized economy workers, was organized. The results of analysis enable central units and economic administration to determine the reasons for absenteeism increase and to apply measures lowering absenteeism rates.

7. A model system (25 Voivodeship Sanitary Epidemiological Stations) of the assessment of environmental toxicological analysis reliability was introduced. This system revealed the inefficiencies of analytical procedures which sometimes had resulted in wrong hygienic evaluations. It also showed deficiencies in professional training of hygienic supervision personnel and distinguished those VSES laboratories which were methodologically well prepared.

8. The system of establishment and verification of hygienic standards determining MAC and MAI of working environment hazards was modified. Informative and expertise base was established for the proper functioning of the system. Basic documentation concerning MAC and MAI

principles of 3 highly developed countries, as well as access to 3 world systems of computer information, were obtained.

9. The results of the efforts to reform the system of health care were as follows:

- the guidelines of the improvement of health care at the workplace were accepted by the Government on 18 December 1981,

- the model of the "free choice of a doctor" principle was put into practice in 1985,

- new principles of the functioning of specialist supervision and new principles of the organization of health service units enabling them to adapt organizational solutions to local needs and staff resources were developed,

- system of bonuses for lack of absenteeism was implemented,

- modified regulations concerning medical specializations were introduced, reducing the number of these specializations.

As a result, an increase of medical personnel by 2,5 thousand physicians was observed in primary health care, as well as a decrease of the average number of patients per one physician. Also medical services accessibility improved.

10. Methodology of the toxicity evaluation of substances to be produced and sold was developed and standardized on a national scale, ensuring the comparability of results.

11. A system of diagnostic examinations enabling prompt diagnostics of acute poisonings was prepared for 120 substances which are the most frequent causes of poisonings. The implementation of this system ensured the efficiency of causal therapeutic procedure and decreased the number of death cases.

12. Up-to-date methods for the evaluation of exposure to industrial dusts, standard methods for the assessment of mineral dusts' biological aggressiveness, methods enabling early diagnosis of pneumoconioses, early diagnosis of carbon disulphide and vinyl chloride poisonings, were worked out and implemented.

It should be stressed that the managers of the coordinating centre and those who put the programme covering such a wide range of problems (sometimes beyond the limits of pure science) into practice, took the risk of partial failure. The programme was focused mainly on the implementation of the results of studies, methodological achievements and effective preventive procedures into health care practice. It is quite obvious that in this case both the progress of the operation and the efficiency of the implementations are conditioned by many factors, to a large extent independent of the coordinator and executors. These are, among others, organization of services supervising working condi-



tions and medical services, legal regulations, participation of state and economic administration and the motivating factors applied to raise the efficiency of medical and preventive care in plants, etc.

During the construction of the programme, attention was chiefly paid to plan studies, the development of which should ensure a more reliable assessment of working environment (identification of hazards, evaluation of occupational exposure, evaluation of the risk of losing health and the ability to work) and to explain the dependence between the health status of the workers of numerous branches of economy, on the one hand, and the effect of specific environmental factors as well as those occurring in the process of work, on the other.

The following lines of research, the results of which may seriously affect the efficiency of monitoring of working conditions and the effectiveness of occupational health and preventive care covering industrial workers, were given priority:

- development of the basic elements of the integrated (intersectoral) system of chemical safety together with designing a project register of chemical substances produced and used in Poland, tested in the conditions of model systems of occupational and environmental exposure to chosen chemicals, setting up a system of toxicological information and ensuring the development of the system of establishing hygienic standards (MAC);

- adopting, together with the programme of cancer control, methodological, legal and organizational bases for the functioning of the system for occupational cancer prevention, and developing methods for the assessment of the influence of factors inducing other delayed health effects;

- development and testing of new methods for the early diagnosis of occupational health impairments before clinical pathology symptoms and temporary or permanent disability to work take place;

- development and implementation of methods which make it possible to select persons hypersensitive to the action of specific environmental factors, in order to avoid the unforeseen health effects of occupational exposure;

- determination and testing of conditions which make it possible to increase the effectiveness of primary health care for industry workers covered by occupational health service;

- adopting and testing under model conditions the principles of the organization and functioning of primary health care, especially preventive care for the employees of small plants not covered so far by the occupational health service;

- development of a more effective system of disabled persons' re-



habilitation, paying particular attention to occupational rehabilitation at the adapted workposts in plants.

It can be seen from the general objectives of the discussed programme that particular attention was paid to the complex problems concerning systemic solutions, i.e. the system of primary prevention prior to the occurrence of health impairments induced by working environment factors, the system of primary health care covering industrial workers, system of primary and preventive care for employees of small plants, occupational rehabilitation system, methodological problems, criteria and organization of the system of selection at workposts for health reasons, and secondary prevention, i.e. elimination of workers from exposed workposts before they lose health and ability to work.

It is obvious that there is a discrepancy between the programme assumptions and the programme itself that is to be implemented within the next five years. Such a situation arises due to the fact that the programme assumptions exceed the planning period. As the programme is aimed at practical achievements, the question is what has been planned to be achieved or implemented during 5 years. It can be seen from the analysis of topics and tasks of particular programme phases that the implementation plan of the main objectives may be briefly presented as follows:

— Methodological and organizational preparation of a chemical safety system in industry, enabling its step-by-step implementation after 1990, in order to cover with complex control chemical substances introduced or applied in the national economy. Implementation of the system will ensure limiting the risk of adverse health effects resulting from occupational exposure to toxic substances. The set of tasks that are to be implemented in the planned period includes:

- development and dissemination of uniform methods for the evaluation of toxicity of chemical substances introduced into industry;
- standardization of methods of exposure evaluation;
- implementation on the Voivodeship Sanitary-Epidemiological Station (VSES) level, of the model system of the assessment of reliability of environmental toxic substances determinations as well as the reliability of exposure tests results performed by VSES and the occupational health service. A system of monitoring of exposure to cadmium will be methodically developed, checked up and implemented. The existing system of life-saving and treatment of acute poisonings is to be adjusted to the present needs, allowing also for chemical accidents. Implementation of this objective is in accordance with the Agreement signed by the Government of the Polish People's Republic with the World Health Organization (WHO) and UNDP.



— Elaboration of the propositions of maximum admissible concentration values in the air of the workrooms for 57 chemical compounds and three industrial dusts together with verification or development of analytical methods of determination, the scope of preventive examinations of the exposed workers, health-based contraindications to employment and recommendations determining hygienic regime and work hygienic conditions. Implementation of this objective conditions functioning of the system of establishing and verification of hygienic standards (according to Convention of International Labour Office) introduced in 1985 by the Ministry of Labour, Wages and Social Affairs in agreement with the Ministry of Health and Social Welfare.

— Elaboration and dissemination of new methods of evaluation of occupational exposure to chemical and physical health hazards occurring in the working environment. The study programme for this objective is, first of all, focused on methodology of evaluation of occupational exposure of rubber, dyes and varnishes industry workers, workers employed in pesticides manufacture and use and in plastics processing. The methods of evaluation of occupational exposure to industrial dusts and electromagnetic fields as well as the modern methods of evaluation of exposure to noise and vibration have also been taken into account. The performance given to this objective is associated with the need for the elaboration of methods of evaluation of exposure to mixed toxic substances occurring in many workplaces, the need for adaptation and verification of the methods of evaluation of occupational exposure to the factors which have not been controlled yet or the need for elaboration of more reliable methods of determination of physical factors intensities with application of the modern measuring techniques.

— Evaluation of the hygienic situation in some branches of industry in which hazards resulting from the applied technologies have not been identified. Undoubtedly, the most important problem here is the evaluation of the hygienic situation in the rubber industry due to unidentified, on an international scale, risk factors and evaluation of the hygienic situation of workers exposed to mixtures of organic solvents during their production and use taking into account the number of the exposed population.

— The use of physiological and psychological methods for evaluation of work load to create the bases for limiting adverse health effects due to the excessive work load. The main tasks to be fulfilled within this objective consist in adaptation and checking, under working environment conditions, methods of work load evaluation and the methods enabling evaluation of capability to long-lasting psychophysical effort, especially on the mechanized and automated workposts as well as identifi-

cation of factors which, under determined conditions, may generate occupational diseases of the locomotor system. The deficit of methods in our country is a common phenomenon whereas the still increasing number of occupational diseases of the locomotor system requires development of precise guidelines for preventive activity.

— Elaboration and dissemination of methods of early diagnostics aimed at raising the effectiveness of detecting preclinical symptoms of occupational diseases in workers of the national economy. Implementation of this objective is associated with collecting data from the previously carried on epidemiological studies indicating the great difference in the number of diagnosed occupational diseases depending on the applied diagnostic methods, high percentage of faulty diagnoses in case of occupational diseases of the hearing organ, detecting — by the OHS units — the changes at the evident pathological stage, which makes application of medical preventive measures impossible. The tasks within this objective are determined by the early diagnostics of the most prevalent occupational diseases which are frequently a cause of permanent disability to work (pneumoconiosis, vibration disease, plumbism, poisonings with solvents and pesticides).

— Impact of the working conditions on the incidence and course of some diseases related to work, in order to implement preventive methods. The tasks covered by this objective consist in: determination of those work factors which increasingly affect the incidence and modify the course of civilization diseases and some others that are not causally related to occupational exposure, as well as specification of preventive measures. The examinations will cover the workers of the coke-making industry, asbestos processing plants, dockers, sailors and health service personnel.

— Principles of vocational selection, based on medical and psychological criteria, of juveniles starting to learn a profession and workers employed on workposts creating a significant risk of health loss or demanding some special psychophysical efficiency. Development and checking up the principles of vocational selection of juveniles undertaking training at trade schools are necessitated by the fact that in Poland there is no uniform system of juveniles vocational selection and that the results of investigations have shown that in about 30% of pupils there are relative or absolute contraindications to employment in the acquired profession. Selection of candidates to the elementary technical school of mining and to the other ones covered by OHS care creates a peculiar problem. In the case of professions requiring particular efficiency (miners, inner transport workers, dockers, workers employed under tropical conditions), the development of principles and criteria requires also



undertaking methodological investigations and their verification in practice.

— Development of health care and a prevention system covering the national economy workers. The priority tasks within this objective consist in the critical evaluation of primary health care and prevention provided by OHS and preparing the project of guidelines determining indispensable organizational and personnel changes, changes in the system of professional training together with a specialization course, in order to obtain improvement in the quality of the provided services and raising the preventive activity effectiveness. The activity of the occupational hygiene section of the sanitary-epidemiological service at the voivodeship level as regards the supervision of working conditions sanitary-hygienic state, in-plant laboratories for environmental studies, field units of sanitary-epidemiological service and preventive activity of OHS in order to verify and update the supervision principles and methodology. The obtained results will constitute a basis for the formulation of guidelines of the National Specialist Committee for occupational health service. Development of the principles of preventive care covering the groups of workers employed in small plants (about 25% of the total number of the industrial workers) as well as the principles of occupational rehabilitation in the plants which have not got any separate rehabilitation departments are the tasks which should be promptly solved.

The programme of cognitive investigations and the so-called "getting ahead" investigations cover 24 particular tasks whose implementation conditions the prospective undertaking of the tasks of direct practical importance and creates a possibility of using the achievements of world science for the working population's health care. The selection of objectives was determined by the needs related to the hygienic or health situation of some defined groups of national economy workers. Although the results obtained during the 5-year planning period cannot be directly put into practice because of the risk of failure and the necessity of their further verification, they may be indirectly used for evaluation and expertise as well as in the preventive activity.

The adopted cognitive investigations will tend towards determination of mechanism of action of the selected chemical and physical factors occurring in the working environment. The results of these investigations will constitute an indispensable element in documentation of maximum admissible concentrations or intensities of occupational health hazards and, in case of chemical agents, they are an indispensable element in their attestation and create bases for studies on methods of detecting health impairments and preparation of exposure biological indicators. Three particular objectives covered by the programme are aimed at obtaining infor-

mation useful for health policy with regard to national economy workers. They concern developmental trends of health care and prevention provided for the working population, evaluation of occupational disease health effects and the preventive activity lines as well as health and social conditionings of sickness absenteeism resulting from these effects.

This shortened description of the general objectives that are expected to be achieved in the 5-year planning period cannot fully reflect the details of their implementation. These details are included in the accepted 118 topics of research. The analysis of concordance of the assumptions with the final version of the implemented plan showed the deficit research lines, which has meant that the achievement of some primarily planned tasks will have to be postponed. The following research lines are, in particular, considered to be deficit:

— Epidemiology of working environment in the form of concurrently performed studies aimed at determination, with the help of epidemiological methods, of health effects induced by occupational exposure (defined in time and magnitude) of national economy workers to factors creating evident health hazard or the little known factors occurring in new production technologies.

— Methodological, organizational and legal preparation of the national uniform system of vocational selection for juveniles beginning to learn a profession together with the development of health criteria for vocational selection.

— Evaluation of the impact of unfavourable working conditions on the course of civilization diseases and some other non-occupational etiology.

— Development and implementation of methods for the exposure evaluation of workers exposed simultaneously to many factors noxious for health.

The national programme for health care of national economy workers started in 1986, included about 120 research topics grouped according to research objectives (about 70 objectives meant for implementation, i.e. putting into practice the research results and scientific-technical progress and 24 cognitive objectives the majority of which condition undertaking prospective studies of application importance). Hence, e.g. the results obtained in the objective "Toxicokinetics of some unsaturated and cyclic compounds" (acrylates, trioxane, dioxolane) will condition undertaking the study leading to the development of exposure biological indicator on the basis of the determination of defined metabolite of tested substance in body fluids. The results of the researches on the effect of low- and



high-frequency electromagnetic fields as well as simple and combined electromagnetic fields, may in the future influence the hygienic standards of that factor in the working environment.

At present, after almost two years of the programme implementation, all topics are subject to evaluation and settlement. It is known that some small number of elaborations (about 7%) does not come up to the expectations for various reasons. Probably some of them will have to be given up. At the same time it seems to be too early to speak of some greater achievements.

The obtained progress in determination and verification of maximum admissible concentrations of toxic substances in the air (about 39 substances for which MAC value was either determined or verified) may be numbered among the achievements of the highest practical importance. The other achievement worthy of notice is extending the range of toxicological analysis quality control performed by working conditions supervision service to all regional units. It is important that the extension of monitoring of miners' exposure to radon in coal and other raw materials mining has taken place. The functioning of the model system of monitoring of exposure to cadmium and lead in non-ferrous metallurgy and in alkaline accumulator manufacturing plants; the progress in poisonings diagnostics; diagnostics of drug addiction made for the needs of vocational selection and development of psychological methods of vocational selection may be also considered as achievements.

It is generally known that new lines of studies resulting from the analysis of the earlier conducted ones and, first of all, from the current evaluation of the health hygienic situation of defined groups of national economy workers, usually encounter some serious difficulties in the initial period of their implementation. These difficulties are chiefly associated with the lack of research tradition and hence of the verified methods and model solutions. The study programme presented by me initiated many new research lines, e.g. evaluation of combined exposure to simultaneous effect of many chemical substances (first of all of organic solvents), or evaluation of the effect of the combined electromagnetic fields. The study of the methods of early preclinical diagnosis of the changes in health status induced by cadmium and phosphoroorganic pesticides as well as studies aimed at development of secondary or — more strictly speaking — tertiary prevention making it possible to eliminate persons hypersensitive to some working environment factors including the carcinogens, are also new lines of studies. We may also number among the new studies of methods for evaluation of effectiveness of the services providing medical and preventive care in industrial plants as well as of models of health and preventive care in small industrial plants.



All these new research lines are now forcing their way through more or less successfully.

It may be assumed that the presented programme of health care of the Polish national economy workers is quite workable. Its implementation — by 19 scientific research centers and universities — has led to a perceptible integration of scientific circles dealing with these problems.

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