

BRAZILIAN PROGRAM FOR PNEUMOCONIOSIS PREVENTION

IRENE FERREIRA DE SOUZA DUARTE SAAD, Industrial Hygienist

• Maria Margarida Teiveira, Industrial Hygienist • Eduardo Algranti, MSc.

Fundação Jorge Duprat Figueiredo de Segurança e Medicina do Trabalho—FUNDACENTRO

Brazil is a developing country located in South America and has 135 million people out of which 55 million are active workers. Economically speaking, Brazil is the 8th largest country in the world.

Until 1950 Brazil was basically an agricultural country. From that time on, the manufacturing industry boomed, resulting in an increase of the mining activities. This made a large number of workers to be exposed to dust which are harmful to their health.

Figure 1 shows data related to this serious problem in Brazil and the continuous increasing number of potentially exposed workers. Due to the fact that until last year all measures in Occupational Hygiene and Medicine areas were taken individually in Brazil, to date there are no available data on this matter. Thus, Brazil Ministry of Labor and FUNDACENTRO have been led to set forth a program for Pneumoconiosis Prevention, following the example of the developed countries.

PURPOSE

The purpose of this program is the control and the reduction of pneumoconiosis cases through primary, secondary and tertiary integrated preventive measures. Primary prevention consists of the workers' dust exposure elimination through the proposition and adoption of environmental control measures, as well as the diffusion of information about the exposure effects and its relationship with the workers' personal characteristics. Secondary prevention implies the early detection of all pathological conditions of the workers, particularly before the onset of pneumoconiosis symptoms. And tertiary prevention involves the minimization of the medical-social complications resulting from pneumoconiosis by means of treatment of the disease and occupational rehabilitation.

In order to attain this purpose, short and medium-term measures were taken, such as:

- a) identification, estimation and registration of the potentially exposed working population, and of the companies and activities which cause pneumoconiosis hazards;
- b) workers and employers' awareness of health hazards caused by pneumoconiotic dust exposure. The diffusion of information about prevention risks and techniques by means of events and educative material will help the workers and employers' awareness;

- c) training of experts for dust environmental evaluation and pneumoconiosis medical evaluation;
- d) control of dust content in work places and medical control of the exposed population;
- e) establishment of pneumoconiosis multidisciplinary centers comprising reference laboratories where environmental and medical analyses, including gravimetric, diffractometric, microscopic and radiological analyses may be carried out;
- f) improvement of occupational safety and medicine legislation concerning the prevention of occupational pneumoconiosis;
- g) subsidies for inspection measures provided by Brazil Ministry of Labor;
- h) subsidies for implementation of epidemiological surveillance programs through epidemiological data obtained from cross-sectional and longitudinal studies of the population exposed to pneumoconiotic dust;
- i) incentives to research into the occupational pneumoconiosis prevention in engineering and medicine areas, which can be developed at institutional level or in graduation and post-graduation courses.

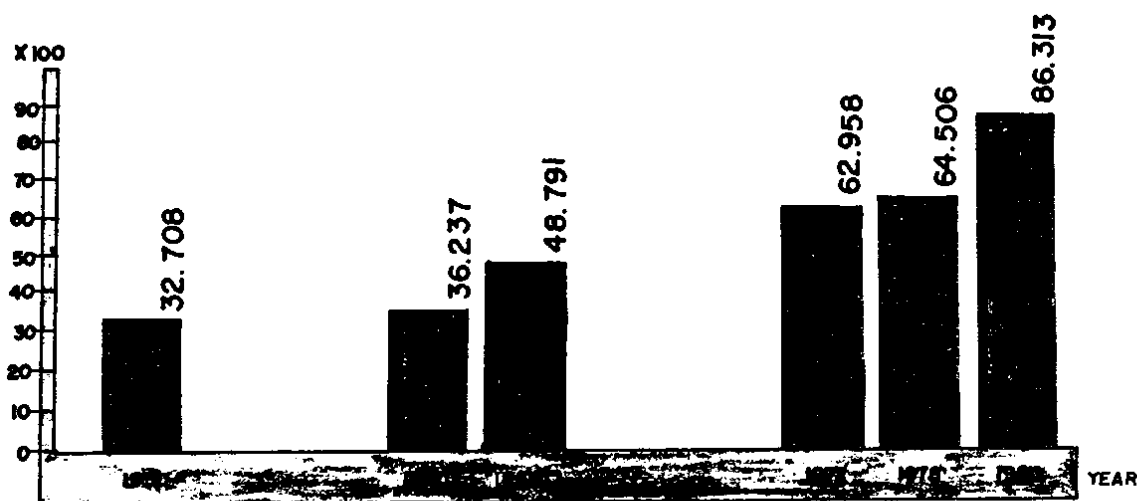
COVERAGE

For a better use of the available material and human resources we decided, firstly, to develop the program in only six Brazilian states, where the largest number of mining and manufacturing industry workers are concentrated (70% of the whole working population in Brazil). Figure 2 shows the distribution of mining and manufacturing industry workers in Brazil.

In the beginning, we will control the exposure of workers only to coal and crystalline silicates, including silica and asbestos which are the causers of a high percentage of occupational pneumoconiosis cases. Figure 3 shows the district chosen for the development of the pilot plan, where the main Brazilian asbestos and coal mines, and the largest number of mining and manufacturing industry workers exposed to crystallized free silica dust are concentrated.

PROGRAM ACCOMPLISHMENT

The program is being carried out by the Ministry of Labor and the Jorge Duprat Figueiredo Foundation for Occupational



MANUFACTURING INDUSTRY WORKERS

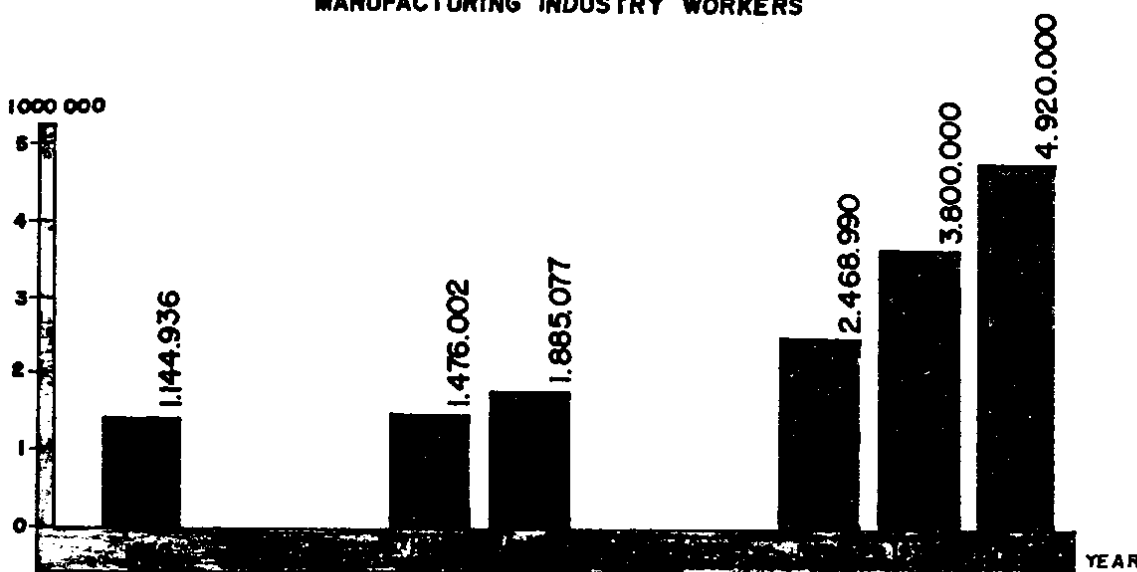


Figure 1. Labor comparative table (1950/1980).

Safety and Medicine—FUNDACENTRO—a nonprofitable entity, which is part of the Ministry of Labor. It was established to conduct research, develop occupational accident and disease prevention programs, and provide technical assistance to public and private organs responsible for occupational safety, hygiene and medicine policy. This program will be successful if workers, employers and Brazilian organs for the prevention of occupational diseases will participate actively in it.

In order to attain the predicted purposes, several steps were estipulated. Some of them will be carried out simultaneously.

In step I, data on exposed workers and data on pneumoconiotic dust exposure sources are being updated, and information channels are being created, since there is no organized information today about the exposure of workers to environmental agents in Brazil.

Questionnaires on administrative data, on registration of industries, and on operational data aiming at identifying the main hazardous operations, the products involved, and the existing control measures were prepared. The predicted number of questionnaires to be applied, in this first step, in all hazard industrial sections, such as mining, ceramics,

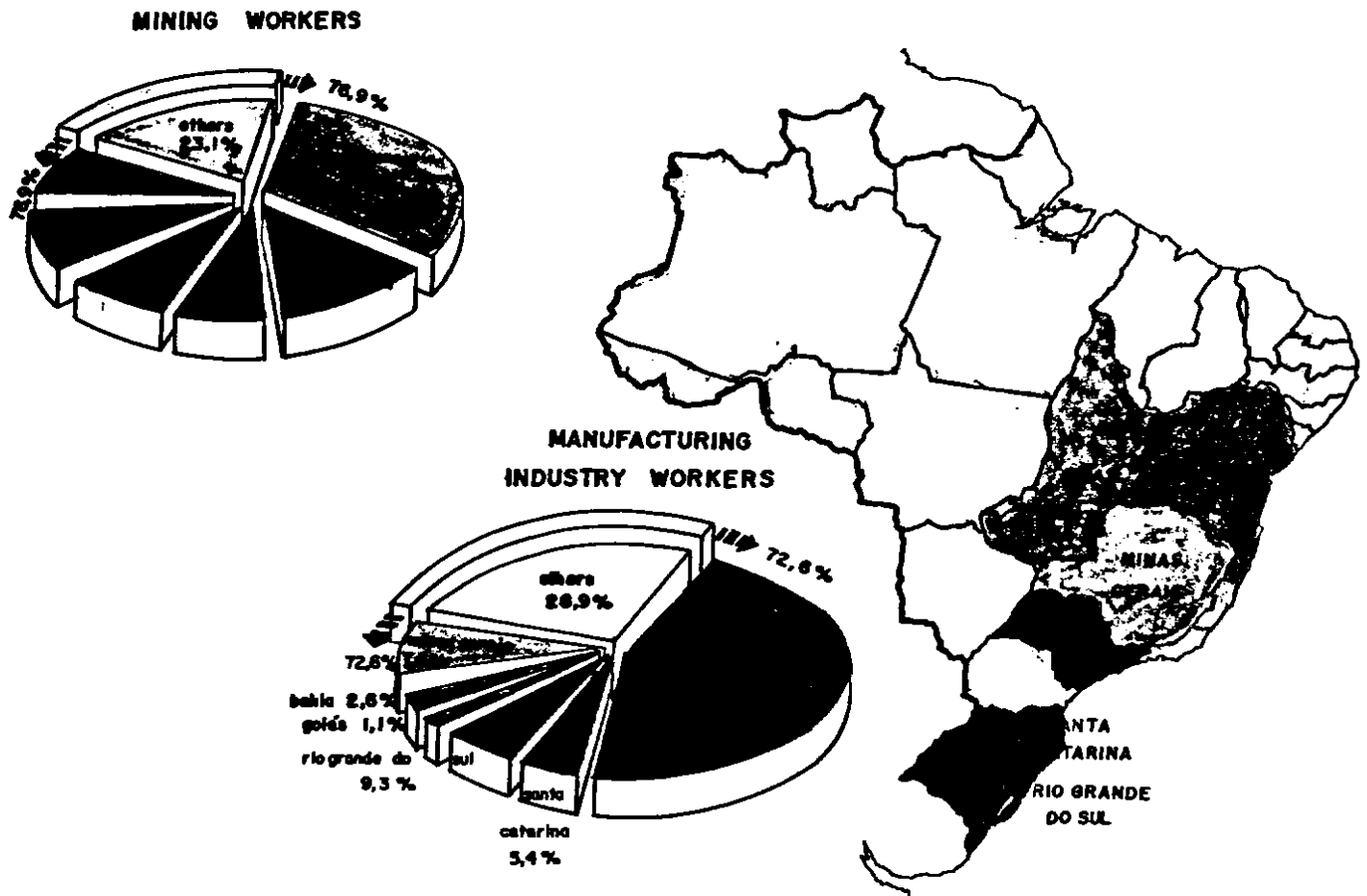


Figure 2

glass industry, foundries, refractories, abrasives, asbestos cement and friction materials is 10.000. 3

Posters and folders were also prepared, as well as technicians from FUNDACENTRO's Regional Unities and from the Ministry of Labor were trained to collect data.

The tabulated data will define the measures to be taken in the next steps, and the information obtained will be widely spread around the community.

In step II, the identification and the evaluation of workers exposure to the hazards in the workplaces and of the effects on their health will be carried out by means of training courses, characterization of workers exposure, and diffusion of the results.

Training courses will be promoted for multiplier agents (governmental and private enterprises professionals) aiming at:

- a) enabling technicians for evaluating and controlling airborne dust, through recognition, sampling strategies, sample collection and analysis, and control measures;
- b) giving credential to support laboratories and standardizing the analytical methodologies of environmental and biological samples by X-Ray diffractometry, gravimetry and microscopy;

- c) training medical teams for pneumoconiosis epidemiology and clinic, comprising radiological classification, pulmonary function evaluation and field work methodology.

The characterization of dust exposure will be made through the joint analysis of environmental and medical data obtained during the visits that the specialized teams will make to the previously selected industries, where they will collect airborne dust samples and will make radiological examinations of the exposed workers, following a methodology developed by FUNDACENTRO together with the Secretaria de Segurança e Medicina do Trabalho (Occupational Safety and Medicine Bureau) of the Ministry of Labor.

In step III, the workers exposure to pneumoconiotic dust and the incidence of pneumoconiosis will be decreased through educative and informative programs, inspection measures, establishment of specialized centers, and improvement of the current legislation. Guidebooks on hazard awareness and on hazard control measures for workers and employers will be prepared based on data obtained in steps I and II. For spreading out information related to pneumoconiosis prevention, posters and folders will be distributed, and seminars and symposia will be held. Thus an intense inspection by the Ministry of Labor of the most hazardous industries, ac



Figure 3. Map of pilot plan.

ording to data obtained in steps I and II, will be possible and efficient.

Additionally, specialized centers for environmental and medical control and evaluation will be established. Its quality will be controlled by National Reference Laboratories of Analytical Hygiene and Radiology being installed at FUNDACENTRO's National Technical Center.

A continuous review and improvement of the Brazilian legislation will be emphasized aiming at the effective protection of workers and the enforcement of periodical data supply on the industries in order to keep updated data on production processes and on medical and environmental evaluation.

Specific programs for pneumoconiosis epidemiological surveillance will also be developed by the Ministry of Health together with the Ministry of Labor in order to evaluate the measures. This will also make possible the relationship between exposure and disease, the study on the respiratory symptoms prevalence of the exposed population, and the technical analysis of pneumoconiosis early detection.

Teams specialized in diagnosis, treatment, mitigation of pneumoconiosis and in professional rehabilitation will carry out the secondary and tertiary measures.

The program will be nationwide coordinated by engineers and physicians of FUNDACENTRO's National Technical

Center and the Secretaria de Segurança e Medicina do Trabalho (Occupational Safety and Medicine Bureau) of the Ministry of Labor and by representatives of the states involved. This coordination team is in charge of the elaboration, follow-up and evaluation of the measures.

CURRENT STATUS

A team has been preparing the material needed to support step 1 measures since 1987 second half.

An administrative questionnaire was prepared for registering the sources where exposure to pneumoconiotic dust can occur. It will be utilized to collect data on working hours, on the number of workers (number of men, women and underage workers), on medical attendance, on the number of trained technicians in occupational safety, hygiene and medicine, on the number of pneumoconiosis cases; on environmental monitoring, on medical examinations for the control of dust exposure, and on training courses. Through this questionnaire information on the specification and quantity of materials employed in the production will be also known.

These questionnaires were on trial in a hundred industries in the state of São Paulo, and it will be applied in the states involved in the program next September.

Another questionnaire was prepared for collecting data on

the operations of industries which generate pneumoconiotic dust.

In order to attain this goal; small, medium and large-sized industries were visited. Based on these data a form was made so as to obtain information on the type of operation carried out in each industry, on the number of equipment used in each type of operation, and on the control measures (starting with the receiving of the raw material and ending with the finished product).

As cleanup is of utmost importance, we also try to know how it is done inside the industries.

In order to obtain the cooperation of workers and employers, posters and folders of the program are being sent to Labor Unions and to Trade Associations.

A previous qualitative analysis of the raw material used in the industries, to detect the presence of crystallized free silica,

is being carried out so that priorities may be established after the tabulation of data obtained through the questionnaires.

Simultaneously, airborne dust measurements have been made in different types of industries for quantifying the hazards and making possible the accomplishment of steps II and III.

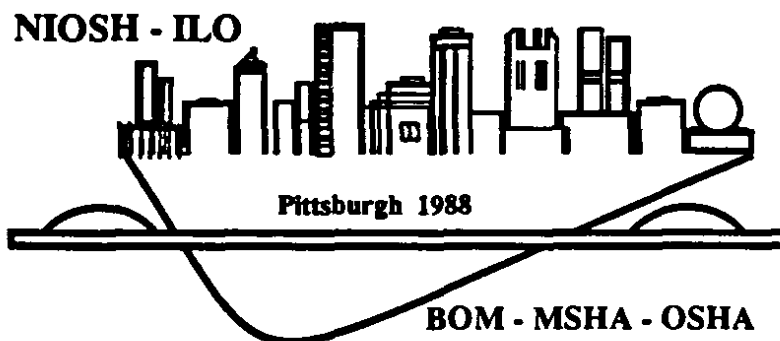
FINAL COMMENTS

The efficiency of the diffusion, awareness, and training will show a significant increase in the number of pneumoconiotic workers, since to date it is common practice in Brazil to retire workers with occupational respiratory diseases as if they suffered from ordinary diseases. This happens because working conditions at the workplaces and suitable techniques for clinical investigation are totally unknown.

The number of workers retired because of sickness will only start to decrease when the real number of pneumoconiotic workers will be registered. Therefore, this decrease will only be attained in a long period of time.

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Part **I**
Tome
Parte



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