

Occupational health services in “small plants” in Shanghai County

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HUANG DY, TANG EL, HU JH, SU CQ, GU XQ. Occupational health services in “small plants” in Shanghai County. *Scand J Work Environ Health* 11 (1985): suppl 4, 13–15. With the reorganization of the grassroots structure and economic readjustment, the commune- and brigade-run plants have now been changed to district (town)- and village-run plants, respectively, and the role of industrial production has become more important to the total income of the people. The Qi-yi Commune (District) is a good example. The number of plants showed an increase of 80 % from 1975 to 1983, whereas the number of workers increased by 149 %. The number of workers as a percentage of the total population of the district grew from 10 % to about 25 %. The rapid progress of industry led to a need to promote occupational health services as part of primary health care. This article reviews the implementation of such services with the objective of attaining the goal “Health for all by the year 2000.”

Key terms: commune (district)- and brigade (village)-run plant, primary health care, small enterprise.

Three years ago the question of occupational health at the county, commune, and brigade levels was raised (2). During the course of economic readjustment and the reorganization of the grassroots structure, the commune- and brigade-run plants have now been changed to district (town)- and village-run plants, respectively, and the role of industrial production has become even more important to the total income of the people.

According to 1979 statistics, the industrial production of Shanghai County accounted for 64 % of the total production of the whole county; this level remained constant until 1983 (65 %). There was a total of 597 plants run by municipalities, counties, communes, or brigades with a total of 132 217 workers (1979). Of these 63 089 workers were in commune- and brigade-run plants. By 1983, the total number of plants had increased to 723 for the whole county. Among these 723, 512 (70.8 %) belong to district- and village-run enterprises, and 92 379 workers were in the small plants, which accounted for 52 % of the industrial population of the County (table 1).

The name “small plant” should be changed now due to the development of collective economics. The increment of plants and workers in the Qi-yi Commune (District) is a good example. From 1975 to 1983 the number of plants increased by 80 %, while the number of workers increased by 149 %. The number of workers as a percentage of the total population in the district (commune) rose from 10 % to about 25 % (table 2).

The rapid progress of industrialization created an urgent need to emphasize the protection of workers' health. Since the survey of 1981, the local government has devoted much of its effort towards keeping the

health care of workers at a pace with the development of industrialization.

The first step has been to obtain more accurate data on existing problems through effective surveys. Table 3 summarizes the number of workers exposed to occupational hazards. In surveys of 1981, among 24 183 workers surveyed in the County, 18 % were exposed to occupational hazards, while in the Qi-yi Commune 33.6 % of the industrial workers were exposed to occupational hazards, excluding pesticides.

The data for the entire county, which were obtained from commune hospitals, was incomplete. For example, hazardous physical factors and vegetable dusts such as grain and cotton dust were neglected. On the other hand, the data for the Qi-yi Commune is accurate since it was obtained by individual unit interviews. The commune survey showed that organic solvents (primarily xylene, with combined exposures to small amounts of benzene and toluene) is the hazard most frequently encountered, followed by heat stress, lead, and inorganic dust. Excessive noise is also common; 16 % of the workers exposed to chemical factors are also exposed to harmful physical factors, including noise. Very few workers are exposed to more than two chemical toxicants simultaneously. Because each commune has a different type of industry, the distribution of occupational hazards varies. For example, in the Qi-yi Commune, no plant workers face hazards from chromium, cyanide, or mercury (table 3).

In the survey of 1983, more workers were found to be at risk of different occupational hazards. Among the 66 294 workers surveyed in the whole county, 34 % were exposed to occupational hazards, while 86 % of the industrial workers in the Qi-yi District were exposed. This difference results from the additional training of health personnel to acquire knowledge in identifying hazards. The data promote the need for the health authority to put occupational health services as a priority in the health care program.

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Table 1. Distribution of plants and workers classified according to different management levels.

	Plant				Worker			
	1979		1983		1979		1983	
	N	%	N	%	N	%	N	%
Municipality-run	117	19.6	154	21.3	58 666	44.4	72 658	40.6
County-run	47	7.8	57	7.9	10 462	7.9	13 895	7.8
Commune (town)-run	182	30.5	227	31.4	33 124	25.1	45 802	25.6
Brigade (village)-run	251	42.1	285	39.4	29 965	22.6	46 577	26.0
Total	597	100.0	723	100.0	132 217	100.0	178 932	100.0

Table 2. Increment in the number of plants and workers in the Qi-yi Commune (District) during 1975—1983.

	1975	1979	1980	1983
District population	15 944	16 382	16 386	18 661
Number of plants	15	21	24	27
Percentage of increase in eight years	.	40	60	80
Number of workers	1 706	2 729	4 197	4 248
Workers as a percentage of the district population	10.7	16.7	25.6	22.8
Percentage of increase in eight years	.	59	146	149

Description of the services

Our occupational health services include the following activities:

1. Strengthening of the occupational health service organization, maintenance of a complete record system, and placement of priority on major problems

In keeping with national economic policy, industrialization at the county and district levels is being encouraged. Occupational health services are regarded as part of the primary health care system. Consequently, the organization of occupational health services has been established at various levels. At the county level, the labor health section in the Health and Anti-Epidemic Station undertakes the duty of organizing a program to train and organize primary health care personnel and give instruction to staff of district hospitals to perform environmental monitoring, health surveillance, and other occupational health activities. We maintain a separate occupational health record for each plant. We identify the major occupational hazards and make them priorities in our work.

The prevention of lead poisoning is one of the priorities. There were 45 plants in the County with some lead exposure, mainly in smelting, lead storage battery production, soldering, and coating. Although, at first, air lead concentrations in soldering and coating operations exceeded the old standard of 0.01 mg/m³, only 10 (8.7 %) of 115 workers were found to have undue lead absorption (categorized according to our diagnostic criteria) by health surveillance.

We focused our work on lead smelting and storage battery production. (The Qi-yi Commune has two storage battery plants.) From 1973 to 1980, we found the prevalence of lead poisoning fluctuating between 4.8 and 13.7 %. This prevalence was comparable to that of larger factories in the 1960s but much less than that in the same plant without prevention in the early 1950s (38.2 %). Further work was done in 1982 and 1983, and the prevalence of lead poisoning was found to be 0.6 and 1.2 %, respectively.

2. Work accomplishment through multisectoral effort and emphasis on self-reliance

For example, in the prevention of pesticide poisoning, we work with the Bureau of Agriculture and the Cooperative Society. The Bureau of Agriculture strictly controls the use of pesticides and organizes the training of plant protectors and sprayers. The Cooperative Society supplies both pesticides and personal protective devices. Similar work was done in industrial plants. In a lead smelting plant, where used storage batteries were smelted to recover lead, for example, equipment was poor, the workshop was small, and the air lead concentration was 40 times that of the standard. In a complete survey, we found the main causes and reported this information to plant officials. The manager put the question to the workers, and they, together, developed measures for preventing and combating pollution through the recovery of lead dust. The prevalence of lead poisoning decreased from 23.3 % in 1975 to 11.4 % in 1979 to 7.6 % in 1981.

For mobilizing multisectoral effort in occupational health and pursuing each plant in preventing its occupational hazards through self-reliance, we did the following: (i) publicized occupational health knowledge by different means; (ii) developed models to demonstrate preventive measures to plants with the same kind of work; and (iii) raised questions to the manager and governing officials in those plants where occupational health had been neglected and suggested measures to solve problems.

3. Establishment of a health inspection system

There is another serious problem. Large factories in the city, where environmental protection may be even more difficult, may transfer their most hazardous work

Table 3. Distribution of occupational hazards in the whole county and in the Qi-yi Commune.

	Whole county				Qi-yi Commune			
	1979		1982		1981		1983	
	Number of plants	Number of workers exposed ^a	Number of plants	Number of workers exposed ^a	Number of plants	Number of workers exposed ^a	Number of plants	Number of workers exposed ^a
Organic solvent	184	4 360	280	6 751	8	373	15	465
Inorganic dust	33	2 975	61	3 125	2	156	17	426
Lead	45	992	62	1 197	2	178	2	171
Chromium	24	468	31	904	—	—	—	—
Cyanide	22	343	32	784	—	—	—	—
Mercury	9	133	2	14	—	—	—	—
Acid and alkali	89	2 090	219	5 099	6	107	8	77
Organic dust	125	5 100	322	9 693	10	69	13	207
Heat stress	104	5 329	370	12 967	8	226	22	938
Noise	..	..	..	..	5	172	27	1 365

^a Not included are those exposed to pesticides.

to small plants in rural areas. Unfortunately, preventive and labor protection measures have not necessarily been transferred along with the production. It is important to establish a health inspection system in these plants to develop and implement preventive health measures. Health personnel were authorized to enforce the regulations developed.

Regulations for worker protection and the improvement of health conditions in the general environment and workshop of "small" industrial enterprises were promulgated on a trial basis. They will be promulgated for all of China after being approved by the Ministry of Public Health of the central government.

4. Training of health personnel

In order to establish an occupational health care system, the training of personnel at different levels is essential. Doctors in district hospitals, barefoot doctors in villages, and health and safety workers in individual plants were taught how to recognize and prevent occupational health hazards, in addition to their routine functions of providing medical care in plants. They were also taught the importance of health education for workers and the methods needed to implement such education. It is desirable to train health care workers in plants which have similar problems at the same time. For example, the health care workers in plants using xylene could be trained together.

A national one-year training course was organized, under the authorization of the Ministry of Public Health of the central government, to train administrators at the county level. The course is offered every year. Shanghai County is assigned as one of the training centers for the nation.

5. Collection of scientific data for research to improve our work

For problems which need further field surveys, we perform research in parallel with our routine work. For improving our field work, our laboratory was

equipped with chromatography and other equipment. We routinely perform precise measurements of lead in ambient air, water and food, and urine and also perform measurements of urinary delta-aminolevulinic acid. For studying the problem of lead pollution, we performed a survey of blood lead among schoolchildren near a smelting factory. All these activities are helpful in raising the standard of our work.

Conclusions

Our work is still in the beginning stages; much more has to be done. The following should be our priorities: (i) developing regulations for preventive measures, strengthening the health inspection system, and paying more attention to the design and construction of new plants to prevent pollution; (ii) organizing plant health and safety teams, composed of representatives of workers, managers, and health personnel; (iii) developing appropriate methods for environmental monitoring to be used by primary health care workers; (iv) establishing reporting systems for occupational injuries and diseases and maintaining complete records of workers exposed to serious hazards; and (v) strengthening research, such as studies on the health effects of vegetable dusts and surveys of other work-related diseases.

Occupational health services at the county and district levels are in an early stage. As we gain more experience, it may be worthwhile to share these with appropriate individuals in other parts of China or in other developing countries (1), with the objective of attaining the goal "Health for all by the year 2000."

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