Use of Teenage Student Volunteers in a Local Health Department

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TEENAGE volunteers have served in the Baltimore City Health Department during the summers of 1959 and 1960. The first summer, 23 high school students and 1 college student contributed 2,550 hours of volunteer service; the second summer 28 students gave 2,070 hours of service. The supervisor of volunteers recruited the teenagers with two objectives: (*a*) the students would help meet certain needs during the summer when clinics are crowded and personnel are vacationing, and (*b*) they would be working in several areas of health and medicine, an exposure which might influence them to choose health careers. The students came from nine public high schools, one parochial school, one private school, and one college. The 1959 group included 22 girls and 2 boys; the 1960 group, 24 girls and 4 boys. Four students worked both summers.

Recruitment

Recruitment of students began in April 1959. A preliminary announcement of the summer program was published in the *Baltimore Bulletin of Education*, a journal of the public schools. The announcement was directed to vocational guidance counselors who were in key positions to inform the student bodies of individual schools of opportunities for volunteer service and certain students with particular interest in health work. This announcement was followed by a number of other steps. The director of volunteers of a local hospital was asked to recommend volunteers she was unable to place in the hospital. School nurses in each secondary school were notified of the plan and asked to assist by making referrals. The director of nursing of the Baltimore Regional Chapter, American Red Cross Nursing Service, and the director of a course in practical nursing were also asked to help recruit.

Finally, a followup notice was published in May in the Baltimore Public Schools *Staff Newsletter*, a publication received by every teacher in the school system. These efforts produced the names of 64 students, 33 of whom were interested enough to come to the health department for interviews. Seventeen came for the orientation period and six additional high school students and the college student volunteered at a later date.

Safeguards

All students were required to fill out an enrollment form containing general and health status information. The health checkup included a physical examination given by the Maryland State Department of Labor and Industry and a tuberculin test by the health department. Parents were also required to give written approval for their children to work in the health department.

The physical examinations given by the State department of labor and industry were required to obtain a work permit that, under the work-

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man's compensation law of the State of Maryland, protects the city from double indemnity if minors are injured at work. These arrangements were decided upon after conferring with the department of labor and industry before the students began work. The students obtained the work permits without charge, and these were kept on file in the health department and returned to the State department of labor on completion of service. Since student workers performed their duties under authorization from the commissioner of health, they were considered to hold the same status as paid employees who are the legal agents of the health commissioner.

Orientation of Students and Staff

The supervisor of volunteers felt the students needed an orientation period to broaden their knowledge of the services and facilities of the health department and to create an esprit de corps within the group. At the close of the school year, one day was set aside for general orientation, including a study tour of health department facilities and the selection of assignments. A second day was devoted to teaching procedures the students would use in their work. During this period the teenagers were issued distinctive volunteer smocks which not only identified them but contributed to their feeling that they were a special group doing a special and important job. Students elected to work in the bureau of public health nursing, bureau of child hygiene, medical care section, and bureau of laboratories.

Orientation of the health department staff who would be working with the students began as soon as the program was conceived. Opportunities for student participation and aims, ideals, and methods for the program were discussed by public health nurse supervisors at their regular meetings. The supervisor of volunteers developed a fact sheet for the volunteer project which was distributed to all public health nurse supervisors approximately 2 weeks before the students reported.

In addition, the supervisor of volunteers attended staff meetings in several district health offices to discuss with the public health nurses the assets and liabilities of teenage assistants and how to plan for them.

Volunteer is instructed in the use of a binocular microscope. Students learn about new equipment and procedures they had not encountered in high school.

One person in each district office was appointed to supervise the students. In two offices a supervisor of public health nursing was made responsible; in the other four, a staff nurse was appointed.

Although students were to work in the bureau of child hygiene and the medical care section and as laboratory aides in the bureau of laboratories, no orientation of staff personnel of these particular units was considered necessary in view of the specialized nature of their activities and the close supervision the staff members would exercise as the students carried out their

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Baltimore's Volunteers

In the Baltimore City Health Department, 1,001 volunteers gave 17,667 hours of service in clinics, schools, and offices during 1960. The program, now in its 7th year, is guided by a volunteers' council and administered by a supervisor of public health nursing.

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duties. However, responsibility for supervision of the students was assigned to the assistant to the director in the medical care section and to the assistant director in each section in the bureau of laboratories. In the bureau of child hygiene, work was distributed without orientation according to the job.

The supervisor of volunteers assumed overall responsibility for the students. She also visited each one within the first 2 weeks of assignment.

Work Record

The student volunteers served during a 10-week period from June 29 to September 4, 1959. Each student volunteered from 1 to 5 days a week. Eighteen of the 24 completed the full schedule, and five contributed an additional week's work because they saw that the health department was busy and could use their services to good advantage.

Hours worked by student volunteers June 29, 1959–September 4, 1959

Activity and student	June	July	August	September	Total
Total hours	59	1,392	1,054	45	2,550
Laboratories	12	486	334	21	853
1	8	72	88	------	168
2	4	123	------	------	127
3	------	88	44	------	132
4	------	67	42	21	130
5	------	136	160	------	296
Well-baby clinics	28	673	660	24	1,385
6	------	65	65	------	130
7	------	61	44	------	105
8	------	40	32	------	72
9	------	57	44	------	101
10	------	14	54	------	68
11	2	75	54	------	131
12	------	57	58	------	115
13	2	48	56	------	106
14	------	24	32	12	68
15	------	24	32	12	68
16	------	45	------	------	45
17	------	------	55	------	55
18	------	------	28	------	28
19	------	42	36	------	78
20	12	41	------	------	53
21	12	80	70	------	162
Prenatal clinics	------	------	28	------	28
18	------	------	28	------	28
Clerical	19	233	32	------	284
22	6	94	14	------	114
17	9	49	------	------	58
23	4	76	18	------	98
24	------	14	------	------	14

The duties in each assignment were varied. In the well-baby clinics students weighed babies, called patients, assisted physicians, and sent out appointment cards. They conducted a play group for children waiting to see the physician in a well-baby clinic. In a prenatal clinic a student acted as registrar and sent out appointment cards.

Five students worked for the bureau of laboratories. In the chemistry laboratory they helped in weighing specimens and materials, prepared outfits for determination of lead in blood samples, tested needles for sharpness, performed tests for lead content of paint, cleaned equipment, wrote up cards, and entered information in laboratory notebooks.

They assisted in recording specimens for the serologic tests for syphilis, and in the microbiology laboratory they cleaned slides, prepared swabs and media, set up plates, and prepared specimen counters. In the supply room they prepared culture tubes and agar plates and assisted the supply clerk.

In the medical care section one student assisted with filing, coding punchcards, and miscellaneous office work (see table).

During the last week in July 1959 the volunteers evaluated the program at luncheon meetings. Their responses were constructive and thoughtful. At this time the volunteers were given an opportunity to change assignments, but only those filing poliomyelitis record cards in the bureau of child hygiene wanted to do so. Discussion centered around two main themes: their work during the summer and their future careers. The girls working in the district offices, with only three exceptions, had previously decided on careers in nursing. One of these three planned to be a physician; the other two were undecided. The prospective nurses had chosen schools and were taking the courses required for admission. All were in the top quarter of their high school class the previous year. For all of them their volunteer service was an initial contact with public health work. Students' suggestions for improvements included more opportunity to see what the nurse contributes to the public health program and to observe home visits and nurse-patient interviews. All claimed they enjoyed their work and felt they had learned a great deal.

The laboratory and clerical workers had a different reaction. They were less certain about their future careers. They saw the summer's experience as a way of finding out more about what it was like to work. Three thought they might be interested in health careers in one form or another. One girl is studying to be a laboratory technician. This group had to learn the importance of doing small tasks carefully and the difficulties of working in situations where peak loads are followed by unpredictable periods of inactivity. They were learning how to work with other people and for the most part were enjoying it. Despite the lack of strong motivation they worked conscientiously and well.

The student volunteers who worked in the health department in 1960 also met for an evaluation session. Reporting what they liked about their work, they said that the "nurses made the volunteers feel that what they were doing was helpful," and the volunteers working in the laboratories felt "they were taking a load off the laboratory workers." The teenagers listed the reasons for setting up the program as "to give assistance to different branches of the health department" and "to give the volunteer an opportunity to learn by watching and practicing."

Commenting on the program, the nurses declared that the volunteers "joined in anything, any type of work," and they "came in and worked as if they were paid." The nurses were "thankful for the work that has been done" and "wondered how they'd gotten along without the volunteers."

Problems

As a group the volunteers performed well. Misfits were few. One girl was reported for tardiness, indifference, and generally poor work. Her work improved after a conference.

One boy was an epileptic. The director of the laboratories and his staff took considerable time and thought to find a niche for him. After a stormy first week, he settled into the routine and worked conscientiously and well. He left at the end of a month to be hospitalized.

When it was feared that the quota of student volunteers would not be met, "very mature" 15-year-olds were accepted. As a group they needed more direction and support than the older students. Most did well with guidance; one girl, because of her inability to work without exact instruction for every minute of her time, was more of a liability than an asset.

Transportation was the greatest problem for most students. Volunteers could have been useful in outlying clinics, but the problem of getting them there was insurmountable in some instances. The girls were timid about going into some areas alone, and their parents didn't encourage them. At times nurses drove to the district office to call for them and returned them to the office when work was over.

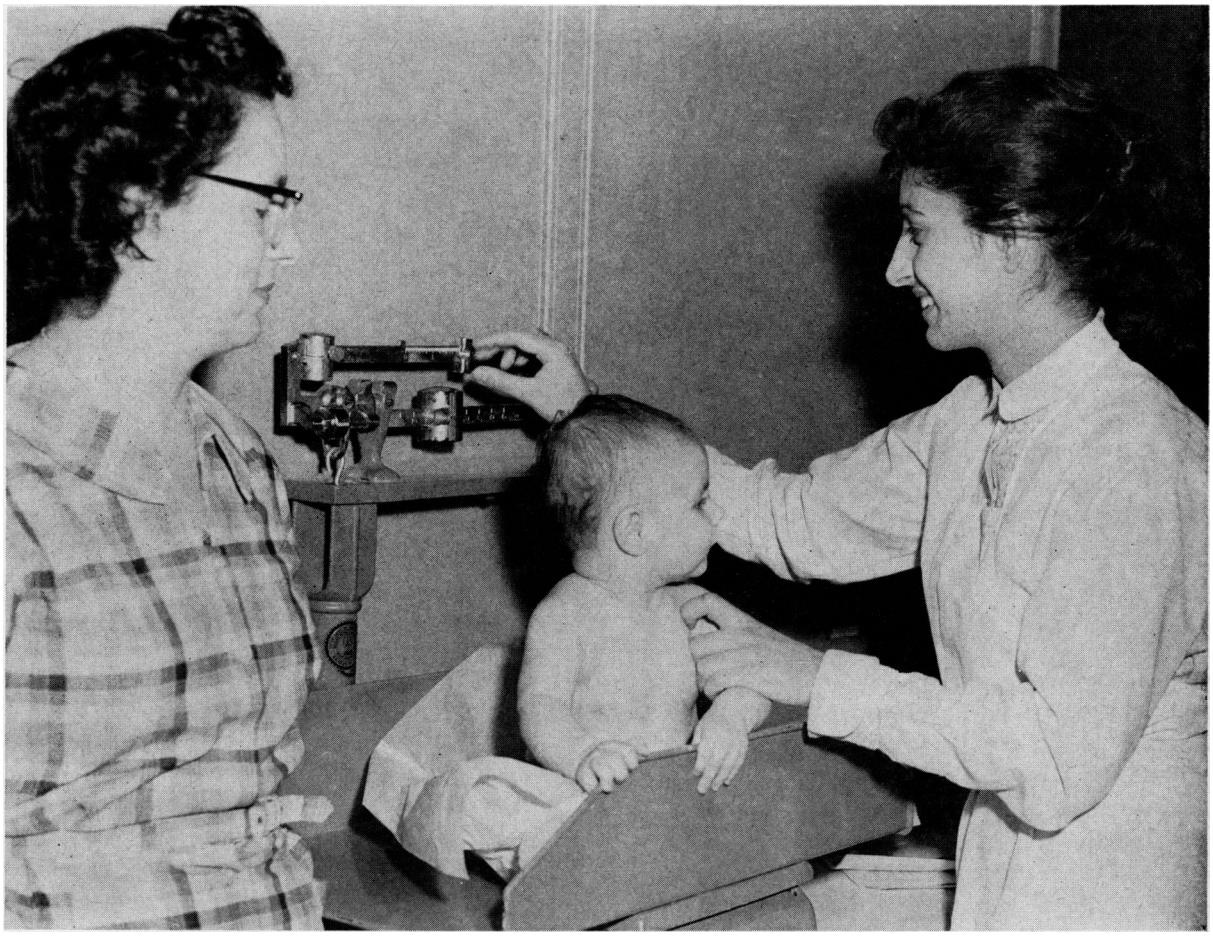
Evaluation

On the whole, staff members considered the summer student volunteer program a good project. The students had a productive and enjoyable summer, and the health department obtained many hours of service for a small expenditure of money. Excluding the salary of the supervisor of volunteers, the cash expenditure amounted to $32.11. In addition to valuing the student services highly because of personnel shortages during vacations, the staff found they boosted morale with their energy and enthusiasm. In some instances volunteers contributed services such as the play project which the department lacked personnel and funds to conduct. It is possible that some students look with favor on a career in public health, and it is certain that the department has acquired new friends.

Some problems resulted. Participants might have been selected more carefully. Should selection always be for the best interests of the department or should students be accepted with the idea of helping them?

The age of students needs further consideration. While 16- and 17-year olds are more adaptable and need less direction than younger persons, with adequate supervision the younger student has a definite contribution to make. Prenursing aide programs are geared to 16-year-olds. Perhaps the health department can perform a real service by giving opportunities to carefully selected younger students.

Work assignments need further considera-



In well-baby clinics, the volunteers assisted public health nurses by weighing babies, acting as receptionists and clerks, and caring for equipment.

tion. The students liked the work in the bureau of laboratories and in the medical care section. It is possible that students could be more useful in office situations. Younger teenagers could work in inoculation clinics. Selected older students might enjoy working in prenatal clinics. Some tasks need to be expanded if they are to be more appealing to restless teenagers.

Public Relations

Residents of the city were fully informed of the student volunteer project through a health department release to local news outlets. In addition to short announcements in the press two feature stories, illustrated with photographs, were written by interested newspaper reporters, and a statement was broadcast by a local radio station. The community coverage served to inform residents of health department activities and career opportunities in health.

Each participant was awarded a certificate of volunteer service and a letter of appreciation for the services they contributed. The supervisor of volunteers sponsored a picnic for the students at a nearby recreation area. A student committee planned the picnic and 11 students and a staff nurse as well as the supervisor of volunteers attended.

Summary

During the summer of 1959, 24 students contributed 2,550 hours of volunteer work to the Baltimore City Health Department. The cash outlay by the health department for the program during a 10-week period was only $32.11.

The students were recruited largely through public school staff bulletins and personnel, the American Red Cross local chapter, and a local hospital. Both health department staff and student volunteers participated in orientation periods. Students worked in various assignments under designated supervisors in public health nursing, child hygiene, medical care, and laboratories. Problems related to work assignments and ages of students need further study. Health department staff members considered the project valuable, and it was continued the summer of 1960, when 28 students contributed 2,070 hours of service.

Social Dynamite

The following is excerpted from an address by James B. Conant to the Conference on Unemployed Out-of-School Youth in Urban Areas, Washington, D.C., May 24–26, 1961. Dr. Conant, emeritus president of Harvard University and former ambassador to West Germany, has recently made a study of American high schools under a Carnegie grant.

In a slum section composed almost entirely of Negroes in one of our largest cities, the following situation was found: A total of 59 percent of the male youth between the ages of 16 and 21 were out of school and unemployed. They were roaming the streets. Of the boys who graduated from high school, 48 percent were unemployed in contrast to 63 percent of the boys who had dropped out of school.

In short, two-thirds of the male dropouts did not have jobs and about half of the high school graduates did not have jobs. In such a situation, a pupil may well ask, "Why bother to stay in school when graduation for half the boys opens onto a dead-end street?"

An even worse state of affairs was found in another city. In a slum area of 125,000 people, mostly Negro, roughly 70 percent of the boys and girls ages 16–21 are out of school and unemployed. . . .

I know there are those who maintain that, on the average, Negro children are inferior to white children in academic ability. I have seen no evidence to support any such contention. . . .

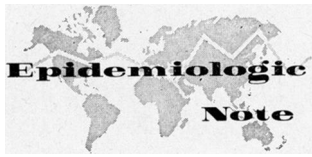
In an all-white slum in a city of considerable size . . . careful study of a group of children in grade 4 of one school showed that their average achievement level was a full year below their grade placement—a typical situation in any slum area. . . .

The task with which the school people must struggle in the city slum is, on the one hand, how to prepare the youth for getting and keeping a job as soon as he or she leaves school and, on the other hand, to encourage those who have academic talent to aim at a profession through higher education. The task thus stated seems simple. In fact, as you all know, the difficulties are enormous. . . .

One teacher said to me, "We do quite well with these children in the lower grades. Each of us is, for the few hours of the school day, an acceptable substitute for the mother. But when they reach about 10, 11, or 12 years of age, we lose them. At that time, the 'street' takes over." . . .

What can be done to offset the demoralizing attitude of "the street" in the worst of the slums? Not much that lies within the province of the school authorities alone. Here is where the social agency people, the juvenile court people, the churches come into the picture. . . .

The situation in which a boy drops out of school only to roam the streets is quite different from the situation in which a boy drops out and finds satisfactory employment. Full-time schooling for certain youths through grade 12 may be good or bad depending upon the employment picture. What goes on in the school ought to be conditioned in large measure by the nature of the families being served, the vocational plans and aspirations of the students, and employment opportunities.



MINAMATA DISEASE

Since 1953, 83 cases of a severe neurological disorder have occurred among residents living in the vicinity of Minamata Bay, Japan. The case fatality rate has been about 30 percent, and most of the surviving patients have been left with severe permanent neurological and mental disabilities.

The onset of the illness, now known as Minamata disease, is acute or subacute and has usually been characterized by peripheral and circumoral paresthesia, ataxia, dysarthria, and dysphagia. Further damage to the central nervous system is manifested by confusion or other disturbances of mental function, constriction of visual fields, deafness, and motor system abnormalities including involuntary movements. Diffuse neuronal degeneration has been demonstrated pathologically, and cellular loss in the granular cell layer of the cerebellum has been a particularly constant finding. There has been no essential difference in incidence by sex, and persons of all ages other than nursing children have been affected.

After early Japanese investigations noted that household cats and sea birds were also affected, a relationship between the eating of seafood from Minamata Bay and the occurrence of this illness was established. The effluent emptied into the bay from a large chemical manufacturing plant was considered as a possible source of seafood contamination. Evidence incriminating an organic mercury compound from the plant as the cause of the outbreak included the following:

- High concentrations of mercury were found in mud and shellfish from Minamata Bay, with maximum values in specimens taken near the outlet of the factory's effluent channel and diminishing concentrations in specimens taken at increasing distances from the outlet.
- By autopsy, mercury was found consistently in brains and other organs of patients and cats dying with this disease.
- Shellfish from the bay or purified organic (alkyl) mercury compounds fed to laboratory cats produced an illness which was clinically and pathologically indistinguishable from that in the spontaneously affected house cats in Minamata.
- The disease in the Minamata area presented striking similarities in clinical and pathological features to human organic mercury poisoning reported from diverse sources.

At the Minamata chemical plant, mercuric chloride is used as a catalyst in making vinyl chloride, for which the annual production increased from 60 tons in 1949 to 18,000 tons in 1959. An estimated 60 grams of mercury are lost in the wash for each ton of vinyl chloride produced, and approximately equal amounts of mercury are removed from the reactors as spent catalyst. Whether some of the mercury from the reactors may also have found its way into the bay during the early years of vinyl production is uncertain.

About 1950, the effluent which had formerly emptied from the factory into the sea was diverted into a new channel opening directly into Minamata Bay.

Minamata disease conforms to the recognized features of organic mercury intoxication whereas inorganic and highly dissociated mercury compounds cause symptoms of damage primarily at sites of absorption and excretion. Therefore, mercury in the Minamata area is presumably discharged into the bay in an organic form, or it is converted into this form by simple marine life or by the biological species which also serve as its vehicle. Organic mercury compounds tend to be bound to red blood cells and are carried in the circulation for longer periods than are inorganic forms which are associated with the plasma fraction. This may afford greater opportunities for organic mercury to affect diverse organ systems, such as the brain, and a selective permeability of the blood-brain barrier may exist as well.

A review of the world literature on organic mercury intoxication indicates that poisonings have occurred mainly in laboratory workers, industrial personnel, or farmers producing organic fungicides or using them on seeds. To date, no outbreaks similar to that in Minamata have been reported. Since mercury is widely used in the production of vinyl chloride, some studies were conducted to assess its toxic role elsewhere.

Large amounts of vinyl chloride are produced near Galveston Bay, Tex. With one exception, shellfish and mud taken from Galveston Bay in the vicinity of factories producing vinyl chloride contained no appreciable amounts of mercury compared with specimens from a control area in the Chesapeake Bay. Mud from one area of Galveston Bay, adjacent to a holding basin where spent catalyst had been dumped, contained 12.5 ppm of mercury. Mud from diverse locations in Minamata Bay had contained mercury varying from 12 to more than 2,000 ppm, and in shellfish from Minamata Bay concentrations ranged from 27 to 102 ppm. Several neurologists in Galveston and Houston were consulted, but none could recall having seen any patients with illnesses suggestive of Minamata disease. A difference in methods of production may account for the general lack of appreciable quantities of mercury in mud or shellfish from Galveston Bay. Texas plants distill rather than wash crude vinyl chloride and otherwise employ

different processes. Dilution factors, the ecology of local marine life, and the dependence on local fish for food among the inhabitants of the Galveston and Minamata Bay areas also differ and could be factors in the differential incidence of the disease.

Since mercury compounds are volatile at distillation temperatures, air pollution studies were carried out in Texas City. Mercury was found in the vicinity of the vinyl plants, but it was below the concentrations considered dangerous.

Recommendations for further studies on unknown features of organic mercury poisoning as well as for possible alleviation of the persisting toxic hazard in the Minamata Bay area have been presented in the paper "Minamata Disease" published in World Neurology, November 1960, pp. 377–395.—LEONARD T. KURLAND, M.D., DR.P.H., *National Institute of Neurological Diseases and Blindness, Public Health Service,* STANLEY N. FARO, M.D., *University of California Hospital Eye Clinic, San Francisco,* HOWARD SIEDLER, M.D., *neurological unit, Boston City Hospital.*

Health Hazards in Uranium Mines

An excessive number of deaths caused by lung cancer and complications of silicosis among uranium mine workers was disclosed at a conference of Governors and their representatives from seven uranium-mining States in December 1960. Proceedings of the conference, recently published by the Public Health Service, provide details on the health status of uranium miners and urge more aggressive action to control radiation hazards.

Since 1950, the Public Health Service, the Atomic Energy Commission, and the cooperating States have examined a total of 3,317 uranium miners. Among 907 white miners from this group who had more than 3 years of underground experience, there were three statistically significant causes of death: heart disease with cor pulmonale, up to 17.8 times the expected rate; respiratory cancer, nearly 5 times as many as usually expected; and nonautomobile accidents, about 4½ times the anticipated number.

In 1957 the triennial medical examinations for the first time included cytological analysis of sputum for cancer cells. Of the 1,075 miners examined, 1,061 were classified negative; 13, or 1.2 percent, were doubtful; and 1, or 0.09 percent, was positive. In 1960, 1,788 miners were examined with the same technique. The first 272 reports showed the sputum from 230 miners was negative; from 33, or 12.2 percent, doubtful; and from 9, or 3.3 percent, positive.

Increases from 1957 to 1960 in the doubtful and positive categories cannot be explained by variations in the examination technique. Their ultimate significance remains to be determined. In other groups examined with this technique, persons whose specimens were positive had at least an 80 percent probability of having bronchogenic carcinoma. The probability for those with doubtful specimens is considerably less, from 20 to 60 percent. Health officers have emphasized the importance of careful followup of men submitting positive specimens.

In 1959, 371 underground mines with 3,619 miners were studied to evaluate the extent of the radiation hazard. Thirty-three percent of the 1,802 samples taken from the mine atmosphere had concentrations less than 1 times the working level (the amount of radiation exposure which it is thought may be maintained over a working lifetime without causing biological damage); 22 percent had between 1 and 3 times the working level; 23 percent had between 3 and 9 times the working level, an increase of 2 percent more than in 1958; and 22 percent, 4 percent more than in 1958, had concentrations of more than 10 times the working level.

It is believed that radioactive contamination in most of the nearly 1,000 active underground uranium mines in the western United States can be controlled. The means of control applicable to each mine can be determined only by individual study. Continuous investigations are being made to spur compliance with measures to control radiation exposures in the mines. Upon request, various agencies of the Federal Government are ready to assist the States in carrying out their responsibilities.

Copies of the proceedings, "Governors' Conference on Health Hazards in Uranium Mines—A Summary Report," PHS Publication No. 843, may be obtained free from the Office of Information, Public Health Service, U.S. Department of Health, Education, and Welfare, Washington 25, D.C.