

Education of Public Health Workers

By EDWARD M. COHART, M.D., WILLIAM R. WILLARD, M.D.,
and FRANCES KORD, M.S.

HOW much formal education have public health workers had? How much training in public health have they had? In what fields have public health workers received major education? What further education do they want?

The Yale Public Health Personnel Research Project sought answers to these questions, in keeping with its mission to study people, rather than operations, in public health. Answers were obtained through interviews with 875 professional and semiprofessional public health workers in the State health departments of Colorado, Connecticut, Florida, Maryland, and Michigan, and in selected local health departments and visiting nurse associations in these States and New York. (An account of the methods used was given in the May issue of this journal, pp. 447-452.) These workers were distributed among the various public health services and classified according to position in the administrative hierarchy as shown in table 1.

The agencies chosen for this study were se-

lected, on the basis of the value judgments of the consultants and advisers to the Yale project, as representative of "better-than-average" health departments. Every public health worker whose activities differed materially from those of any of his co-workers was interviewed. As a result, the proportion of high-echelon personnel interviewed was much larger than the proportion of staff-level personnel. This bias may affect conclusions drawn for the combined group of high-echelon and staff personnel and comparisons between them.

Level of Education

Only 5 percent of the personnel at the higher administrative levels (those of supervisor and higher rank) and 13 percent at staff level had not gone beyond high school (table 2). About 40 percent of the personnel in the statistics service, at both staff and higher administrative levels, as well as 27 percent of the sanitation personnel at staff level and 20 percent of the administration personnel in the high echelons, were in this category.

Thirteen percent of the high-echelon personnel and 32 percent of staff-level personnel had 1 to 4 years of college education but had not received a degree. Whereas 80 percent or more of the high-echelon personnel in most of the services were college graduates, only 40 percent of administration personnel and 47 percent of statistics personnel were in this class. Fifty-five percent of all staff-level personnel were college graduates; the nursing service had the lowest proportion, with 32 percent.

Fifty-three percent of all high-echelon per-

Dr. Cohart, associate professor of public health, Yale University School of Medicine, and Dr. Willard, dean of the College of Medicine at Syracuse, State University of New York, were co-directors of the Yale Public Health Personnel Research Project. Miss Kord, director of health education for the Massachusetts Tuberculosis and Health League since 1953, was a research assistant with the Yale project. The project was supported by research grants from the National Institutes of Health, Public Health Service, and the National Tuberculosis Association.

Table 1. Number of personnel interviewed in official agencies and visiting nurse associations, by administrative level and service

Service	High-echelon ¹	Staff ²	Total
Medical.....	99	13	112
Nursing.....	118	³ 142	260
Sanitation.....	69	117	186
Veterinary ⁴	4	7	11
Laboratory.....	38	87	125
Dental.....	6	6	12
Administration.....	30	3	33
Health education.....	10	20	30
Statistics.....	17	23	40
Nutrition.....	12	1	13
Social work.....	8	6	14
Other professional.....	14	25	39
Total.....	425	450	875

¹ Includes persons with titles of supervisor, consultant, administrative assistant, assistant program director, program director, assistant health officer, and health officer.

² Includes persons classified as staff and senior staff.

³ Includes 1 practical nurse who is counted with "other professional" personnel in subsequent tables and analysis.

⁴ Unless otherwise stated, veterinarians are included with sanitation personnel in subsequent tables and analysis.

sonnel held master's or doctor's degrees. Even when the medical service is excluded, the proportion is still slightly higher than 40 percent. Graduate degrees were least common among statistics and administration personnel. Among staff-level personnel, only 22 percent possessed master's or doctor's degrees. Aside from the medical service, the health education service had the highest proportion of personnel with such degrees.

In general, except for the medical service where the doctoral degree is the rule, graduate education was found to be positively associated with position in the administrative hierarchy. Meaningful comparison could be made only in some of the larger services, such as nursing, sanitation, and laboratory.

In the nursing service, 36 percent of the program directors and consultants, as compared with 10 percent of the supervisors and 3 percent of the staff personnel, had graduate degrees. Among sanitation personnel, 53 percent of the program directors, 17 percent of the consultants and supervisors, and 22 percent of the staff workers had graduate degrees. Among the

laboratory personnel, 66 percent of the high-echelon personnel, 41 percent of the senior staff, and 17 percent of the junior staff held graduate degrees. The laboratory service presented a different pattern from the other two services in that the level of education of senior staff personnel differed materially from that of junior staff personnel.

Because of the marked salary differentials among the several services, the relation of salary to level of education was analyzed for each of the larger services separately. In the medical service, no association could be shown between educational level and salary since all members had doctoral degrees, but in the other services analyzed, a positive association was found.

Six percent of the nurses earning less than \$4,000 and 30 percent of those earning \$4,000 or more had graduate degrees; 40 percent of those earning less than \$4,000 and 75 percent of those earning \$4,000 or more were college graduates.

Among sanitation personnel with salaries of \$4,000 or higher, almost half had graduate degrees, whereas only 5 percent of those earning less than \$4,000 a year had achieved this level of education. One-third of the sanitation personnel earning less than \$4,000 and 85 percent of those in the higher salary brackets were college graduates. Half of the engineers and 6 percent of the sanitarians with graduate degrees held positions which paid \$6,000 or more.

More than half of the laboratory personnel in the \$4,000-and-higher salary brackets and only 6 percent of those earning less than \$4,000 held graduate degrees. It was rare for a laboratory worker without at least an undergraduate degree to earn \$4,000 or more. Only 3 percent of the laboratory personnel earning \$4,000 or more were not college graduates. In the salary brackets below \$4,000, 40 percent of the personnel were not college graduates.

Level of Public Health Training

Public health training was classified into formal and informal. Included in formal training were graduate degrees in public health, baccalaureate majors or minors in public health, and certificates in public health nursing. Planned inservice training (but not orientation as part

of supervision), institutes, short courses, field training, and the study of public health in the basic training of nurses were considered informal public health training.

One-quarter of the high-echelon personnel held graduate degrees in public health; one-fifth had had undergraduate training in the nature of a major or minor in public health or a certificate in public health nursing; and one-third had received informal public health training only (table 3). More than half of the high-echelon medical personnel and an even higher proportion of the high-echelon nurses had had formal public health training, but most of the nurses had received their training at the undergraduate level. Undergraduate public health training of personnel other than nurses was negligible.

Only 7 percent of the staff personnel held graduate degrees in public health, and only 14 percent had had formal public health training at the undergraduate level. Among staff per-

sonnel, as among high-echelon personnel, undergraduate training in public health was restricted almost entirely to nurses. A trend toward the more widespread inclusion of instruction in public health in the basic training of nurses is indicated by the fact that 65 percent of the nurses who had received their training since 1930 had had such instruction, as compared to 45 percent prior to that date.

Approximately half of the staff-level personnel in the medical, nursing, and health education services had received formal public health training, as compared with 4 to 12 percent of the personnel in the other professional services.

In view of the high educational level of many members of the laboratory service, but the relative paucity of public health training, the areas of graduate study of laboratory personnel were investigated. This information was available for 36 laboratory personnel: 86 percent had specialized in the natural sciences; 14 percent, in public health; 8 percent, in medicine; 5 percent,

Table 2. Level of education of personnel in State and local health departments ¹

Administrative level and service	Number of personnel	Percent with—				
		High school diploma or less	1-4 years' undergraduate education	Bachelor's degree	Master's degree	Doctor's degree
<i>High-echelon</i>						
Medical.....	99	0	0	0	0	100
Nursing.....	118	0	22	52	24	1
Sanitation.....	73	7	14	36	37	7
Laboratory.....	38	0	8	26	32	34
Statistics.....	17	41	12	29	6	12
Nutrition.....	12	0	0	25	75	0
Administration.....	30	20	40	30	10	0
Other professional.....	38	8	8	21	47	16
Total.....	425	5	13	29	23	30
<i>Staff</i>						
Medical.....	13	0	0	0	0	100
Nursing.....	141	0	68	29	3	0
Sanitation.....	124	27	18	31	17	6
Laboratory.....	87	11	8	57	18	5
Statistics.....	23	43	9	22	22	4
Health education.....	20	0	20	25	55	0
Other professional.....	² 41	10	36	17	24	14
Total ³.....	449	13	32	33	15	7

¹ Includes visiting nurse associations.

² Information on level of education was not obtained from one staff worker.

³ Total percentages are approximations only, because the staff-level interview sample was not equally representative of all services.

Table 3. Level of public health training of personnel in State and local health departments ¹

Administrative level and service	Number supplying information	Percent with—				
		No training	Informal training only	Formal training		
				Under-graduate education ²	Graduate degree, nonaccredited	Graduate degree, accredited ³
<i>High-echelon</i>						
Medical.....	67	25	18	1	3	52
Nursing.....	85	0	22	66	5	7
Sanitation.....	41	20	60	0	3	17
Laboratory.....	28	28	65	0	0	7
Statistics.....	10	40	50	0	0	10
Nutrition.....	12	17	42	0	25	17
Administration.....	15	87	7	0	0	7
Other professional.....	35	28	37	6	2	26
Total.....	293	21	33	20	4	22
<i>Staff</i>						
Medical.....	12	17	25	0	0	58
Nursing.....	92	4	51	44	0	0
Sanitation.....	71	25	62	8	3	1
Laboratory.....	85	50	46	0	0	4
Statistics.....	21	43	52	0	0	5
Health education.....	14	43	0	0	7	50
Other professional.....	34	44	47	3	0	6
Total ⁴.....	329	29	49	14	1	6

¹ Includes visiting nurse associations.

² Baccalaureate major or minor or certificate in public health nursing.

³ Schools accredited by the American Public Health Association for degrees in public health.

⁴ Total percentages are approximations only, because the staff-level interview sample was not equally representative of all services.

in engineering; and 3 percent, in veterinary medicine.

All the graduates of accredited schools of public health were given the opportunity to discuss the training which they had received, and 80 of them offered comments. It is important to point out some of the characteristics of this group before considering the replies. Approximately half had received their public health degrees since 1945, and only 15 percent, prior to 1935. Professionally, the group was constituted as follows: physicians, 52 percent; health educators, 11 percent; nurses, 9 percent; engineers and laboratory scientists, each 6 percent; dentists, 5 percent; sanitarians, 4 percent; statistics and nutrition personnel, each 2 percent; and administrators, 1 percent.

The most frequent criticism of the public health curriculum was to the effect that not enough instruction was given in the practical

aspects of community organization and public relations. This was closely followed in frequency by statements about the lack of adequate courses in administration. Through many of the comments ran the complaint, either implied or clearly stated, that the graduate curriculum in public health was not practical enough, that it should place much more emphasis on field work, and that perhaps many of the teachers might benefit from current, or at least more recent, practical experience in the field.

Table 3 reveals that one-third of all high-echelon personnel had had only informal public health training. An additional one-third had received such training as well as formal public health training. As can be seen in table 4, informal training was most frequent among nursing personnel and practically nonexistent for administration personnel.

An analysis of the type of informal training

received reveals that, in every service, there was greater participation in short courses or institutes than in any other category of informal public health training. Of all high-echelon personnel, 53 percent had participated in short courses or institutes and 34 percent in field training in other agencies. The extent of participation in field training in other agencies by nurses was at least twice that of any of the other services. Inservice training was the least frequent of the three components of informal public health training.

Two-thirds of the workers at staff level also had received informal public health training, either alone or in combination with formal education in public health. Forty percent had had short courses or institutes; 24 percent had had field training in another agency; and 22 percent had had inservice training.

Staff nurses, like high-echelon nurses, had participated in informal public health training to a greater extent than members of any of the other services. About 90 percent of the nurses

had had some kind of informal training in public health, and 72 percent had participated in short courses or institutes.

Content of Education

The content of major education, that is, "minors" or "majors" at the undergraduate or graduate level, was classified according to nine broad categories as follows: mathematics and the natural sciences, medicine, fields allied to medicine, engineering, public health, social sciences, administration, the humanities, and others. The distribution of public health workers according to this system of classification of major education is given in table 5.

The public health workers in this study can be divided into two groups in accordance with the proportions who had had major education in the natural sciences. In one group are the medical, sanitarian, and laboratory scientist personnel, at least two-thirds of whom have had major education in the natural sciences. The

Table 4. Types of informal public health training of personnel in State and local health departments ¹

Administrative level and service	Number supplying information	Percent with—			
		Any informal training	Inservice training	Short courses	Field training in other agencies
<i>High-echelon</i>					
Medical.....	67	58	9	39	30
Nursing.....	85	95	16	73	64
Sanitation.....	41	80	22	49	19
Laboratory.....	28	71	25	46	25
Statistics.....	10	50	20	40	0
Nutrition.....	12	75	42	58	33
Administration.....	15	7	0	7	0
Other professional.....	32	53	18	68	16
Total.....	290	71	17	53	34
<i>Staff</i>					
Medical.....	12	66	25	58	50
Nursing.....	92	90	17	72	47
Sanitation.....	71	69	39	42	20
Laboratory.....	85	54	15	10	5
Statistics.....	21	57	24	48	4
Health education.....	14	50	7	28	36
Other professional.....	35	60	20	22	11
Total ²	330	68	22	40	24

¹ Includes visiting nurse associations.

² Total percentages are approximations only, because the staff-level interview sample was not equally representative of all services.

Table 5. Content of major education of public health personnel

Category of personnel	Number supplying information	Percent with major education in—								
		Mathematics or the natural sciences	Medicine	Fields allied to medicine	Engineering	Public health	Social sciences	Administration	Humanities	Other
Medical.....	79	68	100	0	0	58	2	0	9	5
Nursing.....	177	2	3	100	0	61	3	0	9	7
Engineer.....	42	5	0	0	100	14	0	2	0	5
Sanitarian ¹	30	70	0	3	3	23	7	3	10	17
Sanitary inspector.....	30	10	0	3	0	3	3	0	3	10
Laboratory scientist ¹	93	91	8	6	6	4	1	0	8	8
Laboratory technician.....	20	30	0	0	0	0	0	0	0	20
Statistics.....	31	16	0	0	3	10	26	10	6	16
Health education.....	22	36	0	4	0	45	14	0	32	32
Nutrition.....	13	0	0	77	0	46	0	8	0	62
Administration.....	18	6	0	0	6	6	6	28	11	28
Other professional.....	59	19	7	47	3	17	12	10	17	20

¹ College or professional school graduate.

second group embraces all the remaining categories of personnel, only one-third or less of whom have had such education.

Medical education was limited almost entirely to the medical service. All the nurses and a large percentage of the nutritionists, of course, had had major education in allied medical fields. Except for an occasional person with engineering training in the administration, statistics, and laboratory services, engineers were limited to the sanitation service.

More than half of the medical and nursing personnel had had formal public health training. They ranked highest in this respect, whereas sanitation, laboratory, statistics, and administration personnel were at the bottom of a rank-order listing.

With the exception of 14 percent of the personnel in the health education service and 26 percent of those in the statistics service, less than 10 percent of the personnel had had major education in the social sciences. The social science education of the statistics personnel was primarily in the field of economics.

Less than one-third of the administration personnel had had major education in administration. None of the physicians, nurses, laboratory personnel, or sanitary inspectors and only 2 to 3 percent of the sanitarians and engineers had had major education in general administration.

One-third or less of the several categories of public health personnel had had major education in the humanities; health education personnel had the highest percentage with major education in these fields.

Because of the prevailing interest in the baccalaureate majors of medical personnel who enter upon careers in public health, this subject was investigated. Eighty-two percent of the physicians had majored in the natural sciences, and 9 percent, in the humanities. The remaining 9 percent were spread among several different fields, with only 1 percent in the social sciences. It is evident, therefore, that education in social sciences could not have been a major factor in directing the paths of these individuals into public health.

Another area in which there has been considerable interest is the baccalaureate majors of health education personnel. The findings in this study corroborate the general impression that health education personnel have diverse educational backgrounds. One-third had majored in the humanities; another third, in the natural sciences; and only 11 percent, in the social sciences. In the group of health educators with graduate degrees from accredited schools of public health, almost half had majored in the natural sciences, but none had majored in the social sciences.

Desire for Additional Education

Approximately 70 percent of 608 professional public health workers (in Connecticut, Maryland, Michigan, and New York) desired additional education (table 6). Differences between State and local personnel were not significant, and the desire for further education was not related to position in the administrative hierarchy. Fewer medical than nursing, sanitation, or laboratory personnel wanted additional education.

Sixty-eight percent of the workers desiring further education wanted individual courses not leading to a degree; 1 percent wanted a baccalaureate degree in engineering; and between 6 and 10 percent desired each of the following types of education: inservice training, institutes, a baccalaureate degree in a field other than engineering, a graduate degree in public health, and other graduate degrees. A significantly higher proportion of high-echelon nurses

(20 percent) than of other high-echelon personnel (4 percent) desired a graduate degree from a school other than an accredited school of public health, and a significantly higher percentage of the staff nurses (30 percent) than of other staff personnel (4 percent) desired a baccalaureate degree.

As a further index of the emphasis placed upon education by different categories of public health personnel, the data were analyzed to determine how many of those without degrees desired them. The numbers without college degrees in the higher levels of the administrative hierarchy were too small for meaningful comparison by service. At the staff-level, 34 percent of the nurses, 23 percent of the laboratory personnel, and 10 percent of the sanitation workers not holding degrees desired them. A significantly higher proportion of nurses than of all other personnel combined desired a baccalaureate degree.

Table 6. Content of education desired by personnel of State and local health departments¹

Administrative level and service	Number supplying information	Percent desiring further education	Percent desiring education in—			
			Public health	Mathematics or the natural sciences	Social studies ²	Humanities
<i>High-echelon</i>						
Medical.....	66	56	39	11	23	0
Nursing.....	84	82	53	5	25	11
Sanitation.....	40	80	57	25	28	0
Laboratory.....	28	68	21	42	4	4
Statistics.....	10	70	30	30	20	0
Nutrition.....	12	92	67	8	33	8
Administration.....	15	60	27	7	33	0
Other professional.....	30	67	43	10	27	3
Total.....	285	72	45	14	24	4
<i>Staff</i>						
Medical.....	12	50	33	8	8	0
Nursing.....	89	79	66	0	16	6
Sanitation.....	69	71	57	17	21	0
Laboratory.....	84	70	20	54	6	0
Statistics.....	21	52	14	29	9	5
Health education.....	12	58	0	0	58	0
Other professional.....	36	58	33	3	25	6
Total ³	323	69	42	20	16	2

¹ In Connecticut, Maryland, Michigan, and New York.

² Includes the social sciences, the science of human behavior, administration, community organization, and the arts and techniques of communication.

³ Total percentages are approximations only, because the staff-level interview sample was not equally representative of all services.

Education desired was divided into four broad categories: public health, mathematics and the natural sciences, social studies, and the humanities. Social studies included the social sciences, the science of human behavior, administration, community organization, and the arts and techniques of communication. The preferences of the members of the several services in accordance with administrative level are to be found in table 6.

Of all the public health personnel interviewed, approximately one-half desired further education in public health; one-fifth, in social studies; one-sixth, in mathematics and the natural sciences; and only a small fraction, in the humanities. A significantly larger proportion of the high-echelon personnel (24 percent) than of the staff personnel (16 percent) desired further education in social studies.

There were a number of significant differences among the services. Fewer laboratory personnel than any other category, except statistics and health education personnel at staff level, desired further education in public health. A much larger percentage of laboratory personnel than of personnel in any other service were interested in further education in the natural sciences, and, correspondingly, a much smaller percentage of laboratory personnel wanted further education in social studies.

A more detailed examination of the desire for further education in public health revealed that the greatest demand among high-echelon personnel was for general public health education. Fifteen percent indicated this preference. Five percent wanted education in environmental sanitation; 5 percent, in medicine; and 3 percent, in engineering. Two percent or less expressed the desire for education in adult health, communicable disease, health education, laboratory science, maternal and child health, medical care, mental health, nursing, or rehabilitation.

Among staff-level personnel, 11 percent desired education in nursing; 9 percent, in environmental sanitation; and 4 percent, in engineering. Seven percent of the staff workers were interested in general public health education. Two percent or less expressed a preference for education dealing with any of the other aspects of public health.

Areas for Evaluation

Although the purpose of the research reported here was simply to determine the facts, it would seem appropriate to point out a few of the areas in which the factual data call for evaluation.

There was a wide range in educational level. Approximately one-tenth of the professional and semiprofessional personnel had not gone beyond high school. Another one-quarter had not received a college degree. Nurses are in an unusual position in this respect, inasmuch as most nurses obtain their training in hospital schools of nursing, which do not grant degrees.

Do these findings indicate that a sizable proportion of the workers have not reached an educational level sufficient to qualify them for their jobs? If the answer to this question is in the affirmative, what are the factors responsible for this state of affairs and how can they be altered?

Or are there forces operating within the domain of public health which place unwarranted emphasis on educational level and therefore lead to the pursuit of academic degrees which do not necessarily contribute to the successful fulfillment of public health job responsibilities? Why, for example, do public health nurses feel a strong need to obtain a baccalaureate degree? Is it because they feel the need for more education in the liberal arts, the social sciences, or the techniques of nursing? Or is it because the possession of a college degree, regardless of area of study, is necessary for advancement?

Undergraduate training in public health was relatively frequent among the nurses and practically nonexistent among the other categories of personnel. Are opportunities for undergraduate education in public health being missed? Or should education in public health be reserved for the graduate level?

Laboratory personnel differ from most other health department personnel in that their interests appear to be restricted to the laboratory and do not encompass the broad field of public health practice. What effect does this have on the "team approach?" For that matter, what is the effect of marked variation in educational level and background upon communication, administration, and a cooperative effort? Does

the common understanding essential for teamwork exist?

A positive correlation was shown to exist between formal education and position in the administrative hierarchy and between education and salary, but exceptions were sufficiently frequent to give one pause. Are these exceptions examples of poor public health practice? Or is formal education perhaps less important than public health workers are in the habit of believing?

It was reported in a previous article that about one-third of the time of health workers was devoted to activities related to administration and community organization. How have public health workers been qualified by education to perform these tasks? Major education in administration was rare indeed, except among personnel in the administration service, and even there it was found among a minority only. Major education in the social sciences, although not as rare as that in administration, was limited to less than 1 in 10 workers. Emphasis was on the natural sciences. Is this adequate preparation for public health practice? Perhaps we have placed too much emphasis on level of education and given insufficient consideration to content.

The importance and value of public health training need reexamination in the light of several of the findings of this study. Between one-fifth and one-third of the public health workers had had neither formal nor informal public health training, and another third had had informal training only. Formal public health training was more frequent among high-echelon than among staff-level personnel and very much more frequent among the physicians, nurses, and health educators than among other personnel. How do these facts influence public health practice? And, conversely, what is the effect of public health practice on public health training?

Only a relatively small proportion of the personnel desired inservice training. An investigation into the reasons for this attitude might be revealing. It is not unlikely that the nature

and caliber of inservice training programs were important determinants of this attitude and that the proper organization of inservice training presents a major opportunity for the education of public health workers. Where does responsibility for such organization rest?

What is the role of the schools of public health in the education of public health workers? It appears that the schools of public health play a major role in the education of medical personnel only. More than 50 percent of the public health physicians and health education personnel had received graduate education in public health, but only about 10 percent of the members of the other services had had such education, many of them in schools other than the accredited schools of public health. Furthermore, informal public health education in the form of short courses and institutes was the greatest single source of public health training for the latter workers and also the type of training desired by the largest number. Schools of public health play a very minor role in sponsoring and giving such courses.

The most frequent criticism of the curriculum of schools of public health was related to the teaching of administration and community organization. A common complaint was that this training was not only insufficient in amount, but also inadequate in scope, because of the failure to include practical applications of principles, in line with the needs of practitioners of public health.

The problem raised by this criticism is part of a broader question which relates to the role of institutions of higher learning generally. Is it the responsibility of such institutions to train investigators and research workers who will enlarge the boundaries of knowledge? Or is it their responsibility to train practitioners to apply present knowledge effectively to the problems of our society? Or is it perhaps both of these? If the responsibility does, in fact, encompass the training of both researcher and practitioner, then it appears that it is not being discharged adequately by our schools of public health.