INDEX

School of Public Health

APPENDICES

Section A-1 History of University

See General Section

Section A-2 History of School of Public Health

The School of Public Health is the outgrowth of the Department of Preventive Medicine and Public Health established in the Medical School in 1922 "to offer appropriate required and elective courses in hygiene and public health for students in the various colleges and schools of the University." Professional training of public health workers at Minnesota had been envisioned as early as 1911 when the Bulletin of the College of Medicine and Surgery stated that "a graduate course for medical health officers will be announced later." In 1914, pursuant to a vote of the Board of Regents, the same Bulletin announced that a "School of Public Health has been organized under the control of the Administrative Board of the Medical School." Unfortunately these plans were never implemented.

When later the Department of Preventive Medicine and Public Health was created, the program in public health nursing, which had been established in the School of Nursing in 1919, was transferred into it. During the ensuing 14 years the Department, relying heavily upon staff of the State Health Department, provided graduate instruction for an occasional student in addition to its heavy load of undergraduate teaching. In 1936, the Department, in response to a coordinated request from the health officers of neighboring states, expanded its program for physicians, engineers and nurses adding full-time staff with public health experience. Four years later the degree of Master of Public Health was authorized by the Board of Regents.

Although the years of World War II were marked by virtual cessation of professional public health programs except in nursing, they were notable through action of the Board of Regents, in accepting a substantial gift from the Mayo Property Associates, changing the Department to a School of Public Health coordinate with the Medical School and the School of Nursing as components of the

College of Medical Sciences. In 1946 the Laboratory of Physiological Hygiene was transferred into the School at its own request and the Regents authorized establishment of the program in hospital administration made possible by a gift from the Kellogg Foundation.

Section A-3 & 4 Physical Facilities of School of Public Health

The School of Public Health, though officially located as a part of the University of Minnesota Health Science Center, is scattered among four locations on the campus and two off campus. Within the Mayo Memorial building it occupies two and one-half floors, viz the 11th, 12th and north half of the 13th, sharing this latter floor with the offices of the College of Medical Sciences, the Medical School, the Minnesota Medical Foundation and the Program in Continuation Medical Education. With the Department of Pediatrics on the 14th floor, and Microbiology on the 9th and 10th, the School is sandwiched in between these two departments that play such vital roles in Public Health programs. The 11th floor is given over to the Divisions of Environmental Health and Epidemiology. The 12th floor is shared by the Divisions of Hospital Administration, Maternal and Child Health, Health Education and Biometry, while the 13th floor houses the offices of the School and the Divisions of Public Health Nursing and Personal Health. Two of the divisions, namely Hospital Administration and Maternal and Child Health, have additional rented space situated about four blocks from the Mayo Building, which space is given over to research programs. The Division of Biometry further occupies space on the ground floor of Ford Hall, which houses the Departments of Mathematics and Statistics. The Division of Environmental Health occupies additional research and teaching facilities on the ground floor of the West Wing of the University Health Service, which is connected with the Mayo building by underground passages. The Laboratory of Physiological Hygiene is located underneath the University Stadium, some three blocks distant from the Mayo building.

The total University space occupied by the School of Public Health is only 40,520 square feet (see Table), which is less than half of the national average of over 90,000 square feet for schools of public health. When it is realized that the School, apart from its almost unique role in providing an extensive program of instruction to students from other parts of the University, has the fourth largest enrollment of the 17 schools of public health in the United States and Canada, the degree of overcrowding becomes very evident. Space designed for laboratory use or as conference rooms has had to be converted to staff offices or desk space of secretarial staff or Ph.D. candidates. Temporary partial partitions have been used to break up rooms into smaller units providing a modicum of privacy. Master's degree students majoring in the various programs of the School have no place where they can so much as sit down in free hours, nor is space for reading rooms generally available within the School. With one exception, rooms originally designed for these purposes have had to be converted to offices. While students and staff alike have accepted these space problems quite gracefully, they do constitute a serious handicap to efficient instruction and research. More detailed description of these quarters by divisions follows:

The Biometry Division occupies about 3035 square feet on the 12th floor of the Mayo building where it has 10 rooms given over to staff offices, a small reading room of only 112 square feet and a student work room with cathode-ray tube connection to the Biomedical Data Processing Center located in a building about two blocks distant and connected by underground tunnels. The rooms used as offices provide only 70 square feet of space per person desked therein.

SCHOOL OF PUBLIC HEALTH

CURRENT AND PROPOSED SPACE ALLOCATION

BY DIVISIONS

SQUARE FEET

	Current***	Proposed
Administration	925	2,000
Conference & Seminar Rooms	2,195	4,500*
Biometry	3,638	9,320
Environmental Health	13,432**	21,020
Epidemiology	2,470	7,660
Health Education	1,000	1,850
Hospital Administration	4,076	10,400
Maternal & Child Health	496	2,300
Mental Health	118	600
Personal Health	251	400
Physiological Hygiene	10,881	18,600
Public Health Administration	--	1,000
Public Health Nursing	1,038	1,940
Unassigned	--	240
Lockers	--	1,350
	40,520	83,180

*2 @ 500 = 1,000
2 @ 400 = 800
4 @ 350 = 1,400
1 @ 300 = 300
4 @ 250 = 1,000
4,500

***The figures for "current" space are the official figures derived from a 1965 study that were used as a basis for planning. Figures in the text differ slightly due to changes in utilization of certain rooms by different divisions.

**Does not include 3,772 sq. ft. in Limnological Laboratory at Duluth.

A machine-equipped statistical laboratory of 894 square feet provides facilities for teaching of Biostatistics to students in Public Health as well as to other students within the College of Medical Sciences. While the primary claim to the laboratory rests with the Division of Biometry, the room also serves as a teaching laboratory for Epidemiology as well as from time to time providing space for other classes. The centralized location of the Division in the heart of the Health Science Center is of vital importance as the staff of the Division devote a sizeable portion of their time to conferences with investigators from other parts of the College of Medical Sciences and the adjoining College of Dentistry, providing consultation as to the statistical aspects of a wide variety of research projects. There is hardly a division of the Medical School that the Division fails to serve at some time during each fiscal year.

The Division likewise maintains a laboratory of 837 square feet in Ford Hall, located about a block from the Mayo building. Here the Division provides instruction in Biometry which is offered to students throughout the University, especially the Graduate School, providing training in the use of statistics in the study of biological phenomena. Since most of the students in these particular courses are not drawn from the School of Public Health but rather from all over the campus, the location of this laboratory nearer the center of the campus is highly desirable though its separation from the rest of the Division produces administrative problems. In planning for future facilities, it is essential to keep in mind that this part of the program of the Division should be made as accessible to other parts of the campus as possible so as to facilitate the use by students and staff from outside of the School. At the same time, the role

of the Division in providing instruction within the health complex and providing statistical consultation to investigators throughout the Health Center is facilitated by location of this portion of the Division as close to the center of the health sciences as possible. Its location on the 12th floor of the Mayo Memorial only one floor removed from the administrative offices of the College of Medical Sciences has been a real asset to the development of this phase of its program.

The Division of Environmental Health occupies 4434 square feet on the 11th floor of the Mayo building providing space for staff offices, most of the teaching activities and much of the research. On this floor are 14 rooms given over in whole or in part to staff offices and to housing of students working on the programs. These rooms with a gross area of 2157 square feet provide desk space for 30 persons, including four persons of full professorial rank, or an average of barely 72 feet per person. The floor is equipped with three general chemical laboratories, a biologic laboratory with adjoining insectary, two laboratories devoted to air pollution studies, and two laboratories for microbiologic studies both of which are equipped with sterile rooms. Two walk-in incubators, one walk-in cold room, a dark room, a small animal room and a utility room complete the environmental health facilities of this floor.

The present crowding of these rooms is such that a significant portion of the laboratories that should be used for research and research facilities has had to be given over to desking of graduate students, thus sharply limiting the number of new students that can be accepted, and at the same time necessitating concentration on projects in which much of the essential data can be gathered outside of these particular facilities.

The Division of Environmental Health also occupies the ground floor of the West Wing of the new University Health Service Building, which is given over to research laboratories, construction of which was facilitated by a PHS Research Facilities grant, the matching money coming from the Mayo endowment of the School of Public Health. In these facilities are a large bacteriological laboratory, two smaller chemical laboratories devoted to and especially equipped for studies of industrial hygiene, specially constructed and shielded radiological health rooms, a repair shop, a small animal and animal autopsy room and a large open space designed for mock-up studies but currently crowded with desks to accommodate graduate students.

On the floor above, the School has two research chambers, one a laminar flow chamber, the other a vertical flow, which have provided the physical facilities for the studies of sanitation of operating rooms and development of sterile facilities for care of organ transplant cases and other types of patients whose immune mechanism has been depressed, therefore leaving them particularly vulnerable to infection. One of these rooms has been made possible by research grants from the National Cancer Institute, the other through a National Aeronautic Space Administration project. Completion of the newly constructed Space Science Building will hopefully provide 2444 additional square feet which must, however, be utilized in connection with NASA supported research projects or contracts. The Division likewise utilizes the Limnological Research Station in Duluth for summer research and research training programs in the field of environmental biology. This laboratory, an old frame building of 3772 square feet, is officially under the control of the Department of Biology

at the University of Minnesota Duluth Campus but the program carried on within it is jointly directed by a member of the staff of the Division of Environmental Health as the senior investigator and the head of the Department of Biology at Duluth. The laboratory, located on the shore of Lake Superior, immediately adjoins the new Fresh Water Quality Laboratory of the Department of Interior. The nature of the construction and the distance from the Twin Cities means that the laboratory is suitable for summer field work but not for all year round occupancy.

The Division of Epidemiology occupies 2528 square feet on the 11th floor of the Mayo building and has recently obtained temporary occupancy of a room of 225 square feet on the 12th floor that should belong to Maternal and Child Health. The 11th floor space provides seven offices suitable for the staff and for statistical type of research, four small laboratories suitable for chemical or bacteriological work, and a small animal room suitable only for small animals.

The Division of Health Education, with two full time professional staff and one secretary, occupies 283 square feet of office space on the 12th floor of the Mayo building. An adjoining conference room, originally designed as a work room for the graduate students in Health Education, has, because of shortage of space, been converted into a general purpose conference room used by all parts of the School, thus depriving the graduate students in Health Education of any real work room for "home base".

Division of Hospital Administration. This division, with about 35 to 40 students in residence and an equal number on a year of residency, occupies

1567 square feet on the 12th floor of the Mayo building, this space being given over to offices to accommodate 7 professional and 3 secretarial staff as well as a library work room of 225 square feet. An adjoining class room accommodates 55 students. While designed for general use of the entire School this room is given over largely to the hospital administration students as they, more than any other group, follow a single pattern of program and, once in the class room, tend to stay in this for consecutive hours of classes, thus minimizing the elevator problem that would be occasioned by bringing a new group of students to the 12th floor of the building for each class hour. This does, however, deprive other parts of the School of Public Health from use of the highly convenient class room. The Division further occupies rented space four blocks away at the corner of Oak and Washington, this space housing two research projects which currently employ a staff of 18.

The Division of Maternal and Child Health, which includes the program for Public Health Nutritionists, is crowded into three rooms. Its staff of three academic positions and one secretary is crowded into only 371 square feet, providing no opportunity for student space or for research programs convenient to the office. Rented space at the corner of Washington and Oak Street four blocks distant provides housing of a research program of this Division.

Division of Physiological Hygiene. The Laboratory of Physiological Hygiene is located under the University Stadium three blocks distant. These quarters were never intended for either permanent occupancy or laboratory work. On the contrary they constituted a temporary improvisation initiated during World War II to provide for research studies undertaken by the Laboratory in

response to War Department contracts. As time passed in the post-war period, the Laboratory expanded step-wise to its present size but always as a supposedly temporary type of installation which has unfortunately become "permanently temporary," and represents unsuitable space for either research or teaching.

Built under the stadium in what is usually waste or storage space, the Laboratory is physically separated from all other parts of the College of Medical Sciences, resulting in a highly undesirable isolation from the standpoint of staff of the Laboratory as well as other parts of the School of Public Health and College, which fail to achieve the potential cross fertilization of ideas that would arise from closer proximity. The Laboratory is completely without outside windows and the sloping character of the stadium seats means that in certain portions of the Laboratory the ceiling is unnecessarily high and in others so low as to preclude full utilization of floor space. Lack of outside ventilation and the necessity of adjusting to stadium exits produces not only problems of ventilation but actual fire hazards in terms of possible exits in case of explosion or fire in one of the chemical laboratories. The location of the Laboratory has been consistently censored and condemned by the State Fire Marshall. There is an urgent need for relocation of many parts of the Laboratory and especially the chemical laboratories to reduce fire hazard.

Within the space allotted to the Laboratory there is a wide range of laboratories, studies and workrooms. A suite of one large and two small connecting rooms with toilet facilities provides a special unit with temperature and humidity control where experimental subjects can live for long periods of time under controlled atmospheric conditions. Two built-in treadmills provide opportunities for controlled exercise. Other rooms provide

space for installation of a vast array of scientific apparatus such as EKG, balistocardiographs, basal metabolic equipment, etc. which can be used in studies of experimental subjects kept under such controlled conditions. Elsewhere in the Laboratories are two chemical laboratories, x-ray room, dining room and kitchen, library and conference room, statistical apparatus and nine rooms devoted to professional staff offices, a large secretarial office, an apparatus shop and storage facilities. Office space for senior academic staff averages barely 70 square feet, not all of which is fully usable because of the sloping ceilings.

Public Health Nursing. This Division, located in direct association with the administrative offices of the School, occupies about 1,000 square feet, 265 of which are given over to secretarial staff while the balance, consisting of 7½ rooms, must accommodate a staff normally consisting of 10 persons, providing an average of less than 75 square feet per academic staff. There are no facilities whatsoever for students to so much as sit down between assigned classes or to work with one another or a staff member on group projects. Two general purpose conference rooms, utilized by the entire School and therefore occupied by other divisions much of the time, provide the only convenient place where the 50 Master's degree students can sit down and confer with one another or with staff other than in single appointments in advisors' offices. Inasmuch as much of the teaching is aimed at group work, the program of the Division obviously suffers greatly from an almost complete absence of facilities where three or four students may get together on their several projects.

Administrative Offices. The administrative offices of the School are located on the north end of the 13th floor of the Mayo Building, providing offices for the Director, Assistant Director, secretarial staff of three and a fiscal staff of three, the latter crowded into a room of only 156 square feet. Essential secretarial office space is shared with Public Health Nursing, separated by a partial partition. Here the School must provide not only its secretarial and record facilities but also share limited space with students and others awaiting appointments with staff, there being no waiting room. The conference room of 234 square feet and three small storage rooms complete the administrative facilities.

UNDERLYING PHILOSOPHY OF SCHOOL

1. Public Health may be thought of as an organized community program designed to prolong efficient human life. As such it seeks to eliminate or to minimize the deleterious effect of the various forces or factors that tend to shorten or to impair life. This means a catholicity of interests, for public health must not only consider these many forces but must be equally concerned with the public whose health it seeks to protect. The School of Public Health at Minnesota believes that the purpose of a school of public health is therefore, 1.) to provide education for those who will be professionally concerned with protection of the public health, 2.) provide education on personal and community health to the public whose health is at stake and 3.) conduct research as to the forces that may lead to impairment of health and methods to eliminate or control these deleterious forces.

It is obvious from the foregoing that public health programs must be thought of as the synthesis of the contributions of a broad range of disciplines, each of which brings to the solution of a problem its own distinctive body of knowledge and its individual point of view. This means that public health must bring together the contributions of a wide range of professions from the fields of physical, biological and social sciences. Public health is therefore a team operation and it is imperative that each member of the team appreciate and have some understanding of the role and contributions of every other member of the team.

Professional training of public health personnel should not, therefore, be carried on in a series of separate and highly compartmentalized vacuums. The physicians should not be trained in one institution, the engineer in another, the nurses in still a third, etc.,

nor in a single institution should they be kept apart from each other or from the general student body for they must not only learn to work with each other but also with the public. While unquestionably a greater amount of technical knowledge can be imparted through a system of educational isolationism whereby each professional group enjoys a monastic separation that permits sharper focus on one small area of public health, such separation tends to narrowness of point of view and eliminates the cross fertilization of divergent points of view.

It is therefore the Minnesota belief that, so far as possible, professional training for public health work should be conducted on the basis of subject matter, not professional backgrounds, and that a conscious effort should be made to bring together in class students of diverse professional and cultural backgrounds. At the same time there should be free movement of students between the courses within the School of Public Health and other parts of the University, thus providing students in other disciplines the opportunity to acquire a better knowledge of public health and by the same token enabling public health students to broaden their horizons through a better understanding outside of their own field.

Equally as important as the professional training is the role of a school of public health in disseminating knowledge to the general public. It has been said that the public is health conscious but hygienically ignorant. Educational institutions, whether at the elementary or the graduate level, are established for the dissemination of knowledge. As the school of public health is presumably the focal point of health knowledge within a university, it has an obligation to provide for its

dissemination within the student body, and, to the extent that the university serves the public at large, to share in this program of public education. The maintenance of health involves not only those who professionally promote health but also those whose health is to be protected. At Minnesota we believe that an educational program that concentrates on one to the exclusion of the other is only half a program.

Section A-7 Planning Process

In planning for the future development of the School of Public Health two special groups were involved, namely, the Public Health Subcommittee of the Committee for the Study of Physical Facilities for the Health Sciences (Learn Committee) and the Directors of the several divisions of the School. The latter, after a series of conferences with their respective academic staffs, submitted their estimates as to increases in student enrollment and future needs of space and staff to handle this increase. These data were reviewed by the Public Health Subcommittee which in turn submitted its report to the Learn Committee. After a determination had been made of the total space to be allotted to the School of Public Health, distribution between Divisions was determined by the division directors while distribution between new construction and remodeling was determined by a special subcommittee of the Learn Committee in collaboration with the architects. The Division Directors of the School were, however, responsible for indicating the desirable utilization of space within the respective square footage allowed to them.

Section B - Community Relationships

The School maintains extremely close relationships with public health agencies throughout the State. Particularly notable has been the long-standing relationship with the State Health Department, which, since 1893, has been located on the University campus in keeping with a general policy that certain community activities find a physical home within the University. Prior to the establishment of a full-time Department of Preventive Medicine and Public Health, members of the staff of the Health Department played key roles within the Medical School, the Director of the State Laboratory at one time serving as Dean of the School.

With the creation of a full-time Department of Preventive Medicine and Public Health in 1922, the participation of the Health Department staff decreased but even today selected members of the Department carry academic appointment and play a vital role within the School. For many years the Director of the State Laboratory has conducted a formal class in public health bacteriology each quarter of the academic year, said course covering a minimum of six hours each week. This course has been taken not only by students in the School of Public Health but by graduate students in the Departments of Microbiology, Pathology and the School of Veterinary Medicine. The Director of the laboratories likewise carries Graduate School appointment, serving on examining committees and as advisor to students particularly in public health laboratory work. Similarly, the public health instruction of the dental students was furnished for many years by the Director of Dental Health of the State Health Department, a situation which continued until the last two years when the Dental School finally appointed a full-time man in the field of preventive dentistry, a man with a Ph.D. in epidemiology and carrying joint appointment in the School of Public

Health or participate actively in courses under the direction of the School's full-time staff.

In the program of Public Health Nursing the School has long maintained extremely close relationships with both State and local health agencies. For many years a full-time member of the nursing staff was physically located in the building of the Rochester-Olmsted County Health Department providing supervision of public health nurses at both the graduate and undergraduate level who were assigned to Rochester for field placement. This relationship was discontinued some three or four years ago owing to the further development of facilities in the Twin City area for the graduate students and discontinuance of the undergraduate public health nursing program. The School now maintains an office in the Minneapolis Health Department. Particularly notable is the Public Health Nursing involvement in the Pilot City project in a depressed area of North Minneapolis, a project operated essentially as a regional out-patient of the Hennepin County General Hospital. Since the inception of this project, the nursing program of the project has been supervised by a nurse whose full salary has been carried out of the School of Public Health. Under a plan that goes into effect the 1st of July, expanded nursing supervision of this project will be provided by staff of the School with reimbursement from the Hennepin County General Hospital out of federal funds provided for this project.

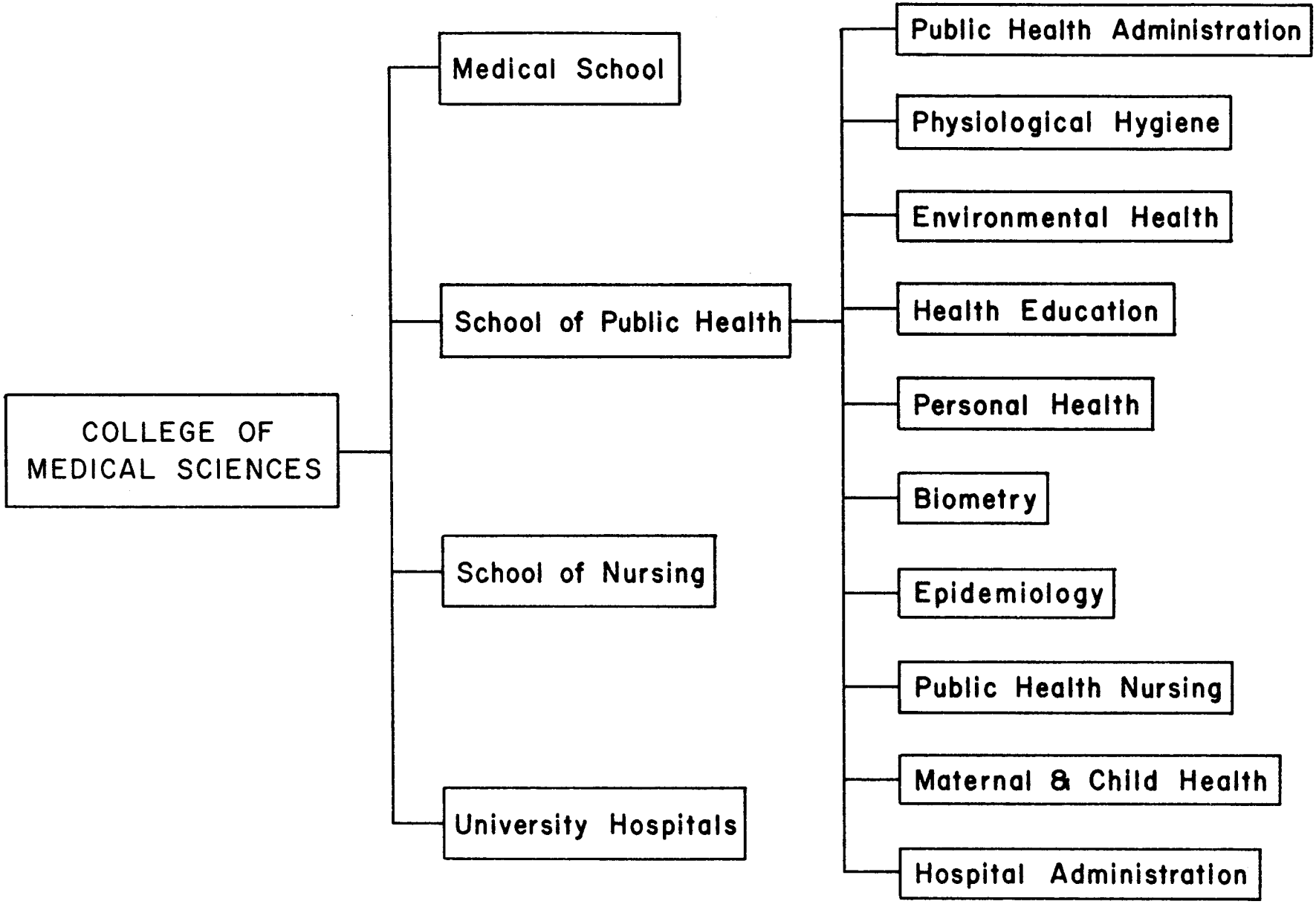
Students in Health Education are assigned for practical work with the Minneapolis Health Department, St. Paul Health Department and more recently to the Community-University medical care project in South Minneapolis and to the Pilot City project. These assignments range from a few hours a week to periods of full-time employment over a period of several weeks or

months, staff of the Division of Health Education exercising almost daily supervision over the work of the students. During the past year students in the winter and spring quarters of the core course have been assigned in groups to work on problems involving both the Minneapolis and St. Paul Health Departments, Ramsey County General Hospital, Hennepin County General Hospital, Community-University Health Center and the Hennepin County Society for Tuberculosis and Respiratory Diseases and the State Planning Agency.

The program in Hospital Administration assigns its students to clinical clerkships in Twin City hospitals during their first year of study and during the second year assigns students to hospitals in various parts of the United States and Canada for a full year of residency under an administrator who carries non-paid academic appointment as a clinical preceptor. These preceptors come together once each year at their own expense to confer with the staff of the School regarding changes and modifications of the Hospital Administration curriculum and to coordinate the programs of experience provided these students under their direction.

Section C - Organizational Structure

As shown on the attached chart, the School of Public Health is one of four components of the College of Medical Sciences, coordinate with the Medical School, School of Nursing and the Hospital. The School is subdivided into the divisions shown on the chart namely, Biometry, Environmental Health, Epidemiology, Health Education, Hospital Administration, Maternal and Child Health, Personal Health, Laboratory of Physiological Hygiene and Public Health Nursing. The School is administered by a committee consisting of the directors of the foregoing divisions or programs.


COLLEGE OF MEDICAL SCIENCES
Medical School
School of Public Health
School of Nursing
University Hospitals
Public Health Administration
Physiological Hygiene
Environmental Health
Health Education
Personal Health
Biometry
Epidemiology
Public Health Nursing
Maternal & Child Health
Hospital Administration

Section C-2 - Services to School by Other Parts of University.

Like other parts of the University, the School of Public Health, in developing its teaching programs, is free to draw upon the academic offerings of various other departments, schools and colleges. The programs of study described in Section G-4 (pages PH-46-133) include, either as required or elective courses, many courses from such departments as Anthropology, Architecture, Chemical Engineering, Chemistry, Civil Engineering, Entomology, Food Science, Microbiology, Physics, Public Administration, Social Work and Speech.

Of special value to the School are its relationships with the University Health Service, the School of Dentistry and the College of Veterinary Medicine.

1. The University Health Service, as implied by its name, is a service organization responsible to the President's Office for the protection of the University community. As such, it is officially recognized by the State Board of Health as a local health department. This means that health services and protection on the several campuses of the University are under the direction of the University Health Service rather than of the health departments of the cities in which these campuses are located.

The Health Service provides invaluable assistance to the School, especially in the field of environmental health. Many members of the Service staff have joint appointments with the School and carry responsibility for various courses or programs. In addition to formal teaching, these staff members provide students with the opportunity for active participation in some of the control programs such as accident prevention, food sanitation, hospital sanitation, laboratory safety and radiation monitoring.

2. School of Dentistry--As explained under the description of the Program in Dental Health (pages PH58-60), staff of the newly created Division of Human Ecology of the School of Dentistry while carrying non-paid or part-paid appointments in the School of Public Health, assume immediate responsibility for conduct and direction of the School's MPH program for dentists. This responsibility includes selection and counselling of students and conduct of special courses on preventive dentistry and dental health. The director of this unit, who has both an MPH and a Ph.D. degree in epidemiology, assists the Division of Epidemiology in its teaching program. Other members of the unit participate in the Program in Health Education and help with some of the sections of the winter and spring core courses.

3. College of Veterinary Medicine--For over 20 years staff of this college (or its forerunner, the Department of Veterinary Medicine of the College of Agriculture) have provided both instruction and day-to-day supervision of the MPH program for veterinarians. Two members of the College staff have MPH degrees, one from Minnesota, the other from Michigan, and both carry non-paid appointments within the Division of Epidemiology of the School of Public Health. Service to the School includes recruitment, selection and counselling of such students, conduct of courses in veterinary public health, and active participation in the basic course in epidemiology. Since the inception of the program, over 100 veterinarians, including 25 from 18 foreign countries have completed the MPH program and several have later pursued Ph.D. programs in either epidemiology or some phase of veterinary medicine.

Section C-3

INSTRUCTION FOR OTHER PARTS OF THE UNIVERSITY

When the Department of Preventive Medicine and Public Health (the forerunner of the present School of Public Health) was established in 1922, the Board of Regents voted that this department was "to offer appropriate required and elective courses in hygiene and public health for students in the various colleges and schools of the University." To implement this policy, the Board of Regents further stipulated that to the budget of this new department "be assigned all moneys (sic) which are now allotted to health and public health instruction in the University ..."

In keeping with this philosophy of concentrating the teaching of health within a single academic unit, the School receives in its professional courses, students from all parts of the University who enroll in one or more courses in Public Health either as a part of their required curriculum or as electives. Most of these are graduate students, particularly from the fields of Engineering, Veterinary Medicine, Microbiology, Social Work, Anthropology and Education. Many students working in these areas have used Public Health courses as their minor in programs leading to either Master's or doctoral degrees. Among such in recent years have been students in Social Work, Anthropology, Veterinary Microbiology and Nutrition.

Particularly notable in this regard has been the large number of graduate students who have availed themselves of the courses in Biometry. Historically, the Biometry unit, which was established before the present development of professional training in Public Health, was created for the purpose of providing graduate instruction in the use of statistics

in the study of biologic phenomena. The basic course of one academic quarter, including laboratory work, has always had a large enrollment from all parts of the University and particularly from the biological sciences on both the Minneapolis and St. Paul campuses. Enrolled also is a large number of students majoring in Psychology or Education with a smattering of students from Mathematics, Journalism and Sociology. The basic course is followed by two additional single quarter courses (both with laboratory work). Some departments of the Graduate School require that their Ph.D. candidates take all three courses, other departments require only two while others require only the first of the three-quarter sequence. With the development of instruction in biomedical computer technology offered through the Division of Biometry, the School has experienced a growing demand for instruction in this phase of statistics for a comparable group of students drawn from all parts of the campus. All of these courses are open to and frequently elected by students in the School of Public Health, and in many cases are required for students completing Ph.D. degrees in such areas as Environmental Health and Epidemiology, thus supplementing the statistics they had in the core part of their MPH program.

The courses in basic use of statistics in the study of biologic phenomena are as follows:

Public Health 110A. Biometry I. Basic concepts in probability; binomial, Poisson, and normal probability models; testing statistical hypotheses and estimation of parameters of probability models.

Public Health 110B. Biometry II. Further consideration of testing statistical hypotheses; interval estimation; regression analysis; correlation; use of ratios; analysis of variance; contrasts and multiple comparison techniques.

Public Health 110C. Biometry III. Analysis of randomized block, factorial and split plot designs; χ^2 applied to frequency data; multiple regression.

Public Health 111A. Biometry Laboratory I. Application of concepts of probability models for random phenomena in the biological and medical sciences.

Public Health 111B. Biometry Laboratory II. Application of concepts of testing and estimation concerning the parameters of the basic probability models; application of regression to bioassay; examples of the use and misuse of ratios; application of analysis of variance to bioassay.

Public Health 111C. Biometry Laboratory III. Basic designs will be illustrated with numerous examples from the biological sciences; application of χ^2 to goodness of fit and heterogeneity tests.

Public Health 120A, B,C Biomedical Computing. Introduction to digital computers and FORTRAN programming, with applications in biology and medicine; information capture, storage, retrieval and display; statistical analysis packages; simulation; analog signal processing; nonlinear models; hospital information systems.

Public Health 120D, E Biomedical Computing. Introduction to digital computer and FORTRAN programming, with applications in biology and medicine. This course is offered only during the Summer Session and constitutes an abbreviation of the foregoing 120A,B,C which runs through the regular academic year.

Public Health 124. Medical Statistics II. Survey of biostatistics for dentists and physicians; elementary statistical methods and their application with emphasis on dental and medical research and appreciation of the research literature; examples taken from recent dental and medical journals.

Public Health 124A. Research Methods in Clinical Studies. Design, conduct, and analysis of clinical studies; prophylactic trials; therapeutic trials; validity and reliability of measurements and calibration studies for the clinical setting; sensitivity and specificity of tests and their application in clinical research and diagnosis; special problems of cooperative studies.

A second group of courses designed for other parts of the University consist of courses which constitute a part of various professional curricula. Notable in this regard are the following:

Public Health 53. Introduction to Public Health. Basic concepts of disease prevention and control through community programs. Designed for and limited to students in the School of Nursing for whom it is a required course.

Public Health 75A. Introduction to Environmental Health. Principles of environmental health relating to water, food, wastes, housing, accidents, radiation, air, industrial hygiene. Designed particularly for students in the College of Pharmacy for whom it is a degree requirement.

Public Health 90. Medical Statistics I. Frequency proportions and probability; rates, measured variables; chance variation and judgment of significance; association. Required of all sophomore medical students.

Public Health 91. Physiological Hygiene. Basic physiological principles and facts.

Public Health 92. Physiological Hygiene. Effects of exercise, nutrition, environment, and age on performance and health.

The above two courses (91 & 92) are designed for students in physical education who obtain their knowledge of physiology through these courses given by the staff of the Laboratory of Physiological Hygiene.

Public Health 95. Human Nutrition. Principles of nutrition, application to individual and family eating patterns, discussion of nutritional aspects of selected community problems or programs. Designed especially for students in dental hygiene but elected by a limited number of undergraduates majoring in other areas.

Public Health 100. Elements of Preventive Medicine and Public Health. Occurrence and prevention of communicable, degenerative, and industrial diseases; health regulation of the environment; maternal and child health. Required of all sophomore medical students.

Public Health 142. Medical Economics. Economic problems of medical and hospital care for community; programs for medical care and health and hospital insurance.

Undergraduate Cultural Courses. A distinctive part of the School of Public Health at Minnesota is its role in giving undergraduate courses in health that are designed for the cultural development of the student rather than as a part of a specific professional training. These courses cover personal and community health and are offered as a part of a program to impart general knowledge of health that one would expect a well informed college graduate to possess, as well as specific knowledge that will be valuable to him in preserving his own health and that of his future family. At the same time it is hoped that the individual, as a future taxpayer and a potential leader within the community, will learn something of the community programs that are carried on to protect the health of the public. These are therefore courses that are of a cultural rather than a professional nature, though they do of course convey technical and scientific knowledge to the individual.

Many parts of the University require one or more such courses as a part of an undergraduate degree program, while many advisors direct the students into these even in the absence of a specific college requirement. The College of Education, however, does require that all students obtain courses in both personal and community health. The major enrollment in these courses is therefore from students in Education or in the College of Liberal Arts before transfer to the College of Education. There is, however, a very large enrollment also from students in Technology, Business and various parts of Agriculture.

Because of the size of the classes these are strictly lecture courses which, during the current year, have had a total enrollment of more than 3,512 students. To accommodate the enormous number of students registering for these, some of the courses are repeated each quarter during the academic year and in one case offered also in Summer Session, in the Extension Program and by Correspondence. Courses of this character are as follows:

Public Health 3. Personal Health. Normal body function; causes and prevention of disease. Offered each quarter of the regular academic year and by correspondence.

Public Health 4. Health Problems of the Community. Prevention of disease in family and community. Open only to students who have completed Public Health 3.

Public Health 5. Individual and Public Health. Basic concepts of cause and prevention of disease in family and community. A Junior College course designed for students who are planning to transfer into Education and satisfying the requirements of that College in both personal and community health.

Public Health 50. Personal and Community Health. Fundamental principles of health conservation and disease prevention. A Senior College course offered each quarter (in the spring quarter this year offered in two sections of 500 students each), summer session, extension and correspondence. Designed particularly for students in Education but widely elected from other undergraduate programs.

Public Health 51. Community Hygiene. Community programs for disease control. A Senior College course in community health designed for students who obtained their course in personal health in the junior college and did not elect Public Health 4.

Section D - Future Expansion

While the long-range plans in the University call for a separate building for the School of Public Health, the immediate plans call for expansion in two steps:

1. Space in Building A to provide for expansion of the Laboratory of Physiological Hygiene and movement of the Division of Epidemiology into new quarters, thus vacating its current space in the 11th floor of Mayo to permit later expansion of the Division of Environmental Health. This construction in Building A is included in the current project.
2. For subsequent years but not a part of this request, the following expansion of the School is planned: (See General Statement)
   a. Expansion of the facilities for the Division of Environmental Health by utilization of that portion of the 11th floor of the Mayo Tower vacated by Epidemiology and remodeling of the entire 12th floor, currently occupied by Biometry, Health Education, Maternal and Child Health and Hospital Administration.
   b. Remodeling of Powell Hall to provide for those parts of the School of Public Health currently on the 12th and 13th floors of the Mayo Memorial. Details of this move will be part of a subsequent project but in general will follow the following pattern:

      5th floor of Powell Hall -- Program in Hospital Administration

      4th floor of Powell Hall -- Administrative Offices of the School and Divisions of Personal Health, Maternal and Child Health, Health Education and Public Health Nursing

2nd floor of Powell Hall -- Division of Biometry

At the same time the School will retain the space it currently occupies in the University Health Service (Environmental Health), Ford Hall (Biometry), and Stadium (Laboratory of Physiological Hygiene). It is anticipated that at some later date all of these components of the School will be brought together in a separate building.

SCHOOL OF PUBLIC HEALTH
1968 - 69

	Academic Salaries		Civil Service Salaries		Total Salary Funds	Supplies & Equipment State	Total State Funds
	State	Other	State	Other			
Administration	$56,478	$26,048	$12,498	$43,309	$138,333	$15,495	$ 84,471
Biometry	$35,842	$96,576	$ 8,216	$16,606	$157,240	--	$ 44,058
Environmental Health	$52,735	$270,655	$19,901	$104,683	$447,974	--	$ 72,636
Epidemiology	$16,100	$36,715	--	$39,087	$ 91,902	--	$ 16,100
Health Education	$23,000	$ 9,600	--	$ 4,440	$ 37,040	--	$ 23,000
Hospital Administration	$51,536	$154,464	$ 5,175	$35,665	$246,840	$ 3,462	$ 60,173
Physiological Hygiene	$57,815	$89,011	$23,485	$52,185	$222,496	$ 5,578	$ 86,878
Maternal and Child Health	--	$77,607	--	$ 8,754	$ 86,361	--	--
Personal and Community Health	$22,100	--	--	--	$ 22,100	--	$ 22,100
Public Health Nursing	$29,180	$59,360	--	$ 9,562	$ 98,102	--	$ 29,180
	$344,786	$820,036	$69,275	$314,291	$1,548,388	$24,535	$438,596

Notes: These data match up with the 1968-69 General University Budget and to the School of Public Health computer listings in the payroll section.

Section E-2. Budget

Figures for 1968-69 and 1969-70 are firm, based on existing budgets. Estimates for subsequent years take account of added space in building A for Divisions of Epidemiology and Laboratory of Physiological Hygiene, providing facilities for expansion of research and training programs. They also recognize potential expansion of environmental health through space being occupied in the new Space Science Building and limited expansion of other divisions through acquisition during the 1969-70 academic year of about 2,000 square feet on the 6th floor of Powell Hall to be occupied until remodelling of second, fourth and fifth floors provides substantial expansion.

School of Public Health
University of Minnesota
Projected Expenditures Through 1975

	1968-1969	1969-1970	1970-1971	1971-1972	1972-1973	1973-1974	1974-1975
Federally Sponsored Teaching and Training Programs*	$1,482,805	$1,550,000	$1,736,000	$1,944,320	$2,216,525	$2,526,839	$2,880,596
Non-Federally Sponsored Teaching and Training Programs	22,000	43,788	50,356	57,909	66,595	76,584	88,072
Total Sponsored Teaching and Training Programs	$1,504,805	$1,593,788	$1,786,356	$2,002,229	$2,283,120	$2,603,423	$2,968,668
Federally Sponsored Research Programs	$1,604,716	$1,700,000	$1,904,000	$2,132,480	$2,431,027	$2,771,371	$3,159,363
State, County, and City Sponsored Research Programs	6,839	10,669	12,163	14,352	16,074	21,539	27,139
Private Gifts and Grants Sponsored Research Programs	11,000	17,160	19,562	23,083	25,853	34,902	43,977
Total Sponsored Research	$1,622,555	$1,727,829	$1,935,725	$2,169,915	$2,472,954	$2,827,812	$3,230,479
ALL SPONSORED PROGRAMS	$3,127,360	$3,321,617	$3,722,081	$4,172,144	$4,756,074	$5,431,235	$6,199,147
State Support-Regular Teaching, Research, and Training	438,596	467,594	493,606	647,926	807,155	983,028	1,160,565
Overhead (38%)	166,666	177,686	187,570	246,119	306,719	373,551	441,015
TOTAL SCHOOL OF PUBLIC HEALTH COSTS	$3,732,622	$3,966,897	$4,403,257	$5,066,189	$5,869,948	$6,787,814	$7,800,727

*Federal funding on research and training grants and contracts will not be normally incremented for 1969-1970. For 1970-1971 and 1971-1972, the increase factor is estimated at 11% annually. The remaining three budget periods are projected at 14% annually to project normal growth with a very modest catch-up factor.

SCHOOL OF PUBLIC HEALTH
University of Minnesota
Salary Projections Through 1975*

Budget Period	Academic Salaries State	Academic Salaries Other	Civil Service Salaries State	Civil Service Salaries Other	State Supplies and Equip.	Total State Funds
1968-1969	$ 344,786	$ 820,036	$ 69,275	$ 314,291	$ 24,535	$ 438,596
1969-1970	365,473	869,344	77,586	333,148	24,535	467,594
1970-1971	387,401	921,505	80,689	346,474	25,516	493,606
Merit	23,244	55,290	6,455	27,718		
New Pos.	75,000	150,000	48,600	97,200		
1971-1972	485,645	1,126,795	135,744	471,392	26,537	647,926
Merit	29,138	67,608	5,430	18,856		
New Pos.	75,000	150,000	48,600	97,200		
1972-1973	589,783	1,344,403	189,774	587,448	27,598	807,155
Merit	35,987	80,664	15,182	46,996		
New Pos.	75,000	150,000	48,600	97,200		
1973-1974	700,770	1,575,067	253,556	731,644	28,702	983,028
Merit	42,647	94,504	10,142	29,266		
New Pos.	75,000	150,000	48,600	97,200		
1974-1975	$ 818,417	$1,819,571	$ 312,298	$ 858,110	$ 29,850	$1,160,565

* Academic salaries are increased 6% annually for merit raises. Civil Service salaries are similarly increased but at 8% and 4% amounts in alternate years. On the basis of the percentage of Minnesota resident students enrolled and on the basis of graduates who stay in Minnesota, a one-third proportion of state salary support would be warranted in looking toward 1975. In the above schedule, approximately 30% of the salary charges would be support funds through the provision of new position money. The support budget for Supplies, Expense, and Equipment is incremented by 4% each year.

Section F

ACCREDITATIONS

The Master of Public Health program is accredited by the American Public Health Association, the last accreditation being in 1966. The usual time interval for accreditation visits is four years.

The Public Health Nursing programs are accredited by the National League for Nursing, the last visit being in 1965.

The program in Hospital Administration received automatic accreditation by the Association of University Programs in Hospital Administration which at the time of initiation of its accreditation program blanketed in existing programs subject to later review. Such a review of the Minnesota program has not yet been scheduled.

At the time of the 1966 accreditation by the American Public Health Association, the site visit team made the following comments and recommendation:

COMMENTS

> "This School of Public Health perceives as one of its responsibilities the dissemination of knowledge to members of the general public concentrating largely on University students, in addition to the professional preparation of public health workers. This tends to extend the influence of the School of Public Health beyond that generally observed for such an institution, but at the same time it imposes an extra-ordinary burden on the Faculty.
>
> "As is the case with many other Schools of Public Health, the space provided for in the original plans was quickly outgrown, resulting in extreme shortages, now constituting a serious chronic problem. In spite of the awareness by the University authorities of this condition, no steps for alleviating it are being taken or even being planned in a concrete form at the present time.
>
> "The financial growth of this institution over the three-year period mentioned is reasonable and commendable. However, the space problem is a block to further growth, even though funds for addtitional activities may be available.

"Related to the question of space is the Faculty problem in several important key Divisions, namely, Public Health Administration and Epidemiology. The low figures in these subjects compare rather unfavorably with those in others. It should be noted that Faculty Members of all, or most, of the Divisions participate to a large extent in teaching of students from other schools and colleges within the University. An additional burden in the teaching load is the practice in this School of providing more than one course in some subjects for different levels of knowledge, experience, and sophistication of the students. While this is necessary, it poses additional burdens on Faculty time and indicates that additional Faculty Members are needed urgently. Current space availability precludes the employment of additional personnel, which in turn makes the space problem central and crucial."

RECOMMENDATION

"That this School of Public Health, and the University as a whole, take all possible and immediate steps to increase available space, necessary not only for expanding programs, but also for those which presently suffer under these shortages."

Section G

G-1: CURRICULUM PLAN

The several curricula carried on through the School of Public Health are developed in keeping with the foregoing basic philosophy of the interrelationship of the several disciplines that contribute to a comprehensive health program. The various programs of study are designed to meet the needs of students of quite diverse professional backgrounds seeking to qualify themselves for equally diverse functions in community public health work. In development of programs of study the School can avail itself of the enormous number of course offerings of other colleges and departments of the University. The physical compactness of the University facilitates this utilization of courses from other parts of University.

Master of Public Health Degree Program. The degree of Master of Public Health is to be thought of as a professional degree, indicating a fundamental understanding of the manifold aspects of a health program but at the same time providing the student with a certain amount of specialized knowledge according to his particular professional interests. Students of quite diverse backgrounds are admitted to this program, such backgrounds including biology, chemistry, dentistry, education, engineering, medicine, nursing, nutrition, physics, statistics, veterinary medicine, and most recently physiotherapy. Admitted also has been an occasional individual who has not achieved prior specific professional background but who has had a broad spread of baccalaureate training, several years of experience in public health work and is being trained to occupy an administrative rather than a professional position. With only a few exceptions, all students in the MPH program have had practical public

experience and, in a high proportion of the cases, are on educational leave from their employing agency which is requesting and, in many instances, financially sponsoring the period of study.

All students on the Master of Public Health program are required to enroll in a core sequence, including Public Health 100A,B, and C and courses in Environmental Health, Epidemiology, Health Education, Public Health Administration, Public Health Nursing and Statistics. This core constitutes about one-third of the total credits required for a degree, leaving the balance to electives within the student's area of special interest. Thus public health nurses will elect courses especially designed for nurses, physicians elect courses of a more medical or administrative nature, while students in Environmental Health will obviously choose from courses dealing with control of environmental hazards including water sanitation, waste disposal, food and milk sanitation, insect control, air pollution, radiological hazards, accident prevention and institutional sanitation.

Whenever possible students are put in class together so as to give them an understanding of different points of view dependent upon different professional and cultural backgrounds. Such mixture of students is achieved particularly in the 100A,B, and C sequence and in the courses in Epidemiology and Public Health Administration. Separate courses in areas such as Statistics are essential, as the background of the students is quite different and therefore the speed with which they can progress as well as their special needs are different. Thus engineers with a good mathematical background would progress more rapidly in statistics than would nurses. A course geared to the engineers would be mathematically beyond the capacity of the nurses while engineers would find the pace of

a course geared for the nurses to be too slow and not sufficiently challenging. It is essential, however, that all of the various groups have some basic understanding in each of the core courses.

To qualify for the MPH degree the student must achieve an honor point average of at least 2.75 (A = 4, B = 3, C = 2 and D = 1) in the total program, and at least 2.5 in all Public Health courses and in the core courses. All students, regardless of background, take the same comprehensive examination at the end of the academic program of study, satisfactory passing of this examination being requisite for aware of the degree. All students are also required to submit papers of the quality if not the range of a Master's thesis in courses totaling 9 credits, which is the same as the requirement of the Graduate School for a Master's degree program on a non-thesis (Plan B) basis. Decision as to the courses in which such papers are to be written is made by the student's advisor but decision as to topics and acceptability of plan of papers rests with the instructor of the individual courses.

Master of Hospital Administration Program. This program, requiring two and a third academic years of study was originally designed for students seeking careers as hospital administrators but as time has passed has come to be broadened to place equal emphasis on planning and direction of programs for the delivery of health care. The name of the responsible division is being currently changed to Health Care Administration. The students admitted to this program usually come with a background of social sciences, (especially economics) and, in at least half of the cases, have had one or more years of experience in hospital work. This program includes a core almost identical with that for the MPH namely 100A,B, and C and courses in Environmental Health, Health Education,

Public Health Administration, Public Health Nursing and Statistics. A formal course in Epidemiology is not included, the students knowledge in this area being derived from Public Health 100A which is largely epidemiological in nature and for the MPH students, serves as an introduction to the formal course in Epidemiology of the winter quarter. In addition to this core, students in the Hospital Administration program concentrate on courses in hospital and health care administration. The curriculum is more or less fixed for all students, leaving little opportunity for electives. Prior to the present class the students, after completion of the nine-months academic year, have been required to spend one calendar year on a preceptorship in a hospital selected by the faculty of the program, the administrator of said hospital carrying academic appointment as a Clinical Preceptor. Effective with the coming summer these students will be kept in class work throughout the first and possibly the second term of the summer session.

After a one-month vacation, most of them will go on to a residency such as has been required of all students in former years. A few, whose interests are primarily in the field of comprehensive health care, will return to the University for a second academic year of study in which emphasis will be placed upon course work in related areas outside of the School of Public Health such as public administration, sociology, social work and economics, the electives varying according to the special background and interest of the student.

Master of Science Degree. Programs leading to the Master of Science rather than the Master of Public Health degree are available through the Graduate School. Such programs are designed essentially for students who have a somewhat more restricted interest and who wish to obtain

greater concentration in one area even at the expense of a broader knowledge of the vast field of public health. Thus a student with a chemistry background whose interests are in the field of air pollution control may profitably spend his time to better advantage in concentrating on more work in chemistry, engineering and meteorology than in courses in health education, epidemiology or public health nursing while a student with a physics background may spend his time more profitably with courses in nuclear physics, nuclear reactor design and chemistry. All students in Master of Science programs are required, however, to take the core course 100A,B and C. The balance of their program being elected according to the requirements of the Graduate School rather than the School of Public Health even though their major is Public Health or one of its essential components such as Environmental Health. The Master of Science program thus provides for greater freedom of electives and more specialization at the expense of breadth of health knowledge.

Degree requirements for a Master of Science degree are in other respects essentially the same, with a 2.8 honor point average in all courses, the requirement of the three papers in courses totaling nine credits, and a final oral examination by a committee appointed by the Dean of the Graduate School and in most cases drawing upon departments outside of the School of Public Health. At the present time, about half of the first year students in Environmental Health are working in Master of Science rather than Master of Public Health programs. Nurses already possessing a rather broad background of experience in public health nursing and seeking careers in teaching public health nursing in collegiate schools of nursing find this degree program offers them a greater

opportunity to supplement their public health courses with courses from the College of Education.

Master of Science. Since the Division of Biometry is recognized by the Graduate School as a separate department, the Division has a substantial number of graduate students who obtain their Master of Science degree with a major in Biometry but without necessarily having courses offered through other parts of the School of Public Health. These are students with a mathematical background who are not seeking employment with public health agencies but rather a career in statistics and more particularly the application of statistics to the solution of biologic problems. These students take a strong major in Biometry, usually doing their minor fields and collateral courses in mathematics or even in theoretical statistics. A substantial number do however elect public health courses, notably the basic 100A which is the first of the core courses and serves essentially as a broad introduction to the field of public health. Some of these graduate students take a broad range of public health courses and in a few cases have actually completed the same core as is required for the MPH degree.

Doctor of Philosophy Degree. Programs leading to the degree of Doctor of Philosophy, offered through the Graduate School, are available in five areas of study, via, Biometry, Environmental Health, Epidemiology, Hospital Administration and Physiological Hygiene. Each of these divisions of the School of Public Health has been recognized by the Graduate School as a separate department even though the courses offered by these divisions all carry Public Health designation. Students in such programs are registered in the Graduate School and satisfy all the usual Ph.D. requirements including class work, knowledge of foreign languages, preliminary

oral examination and completion and defense of thesis. In each of the foregoing areas certain staff of the divisions have been designed by the Graduate School as qualified to serve as advisors on doctorate programs. Other members of the staff are limited to serving as advisors on Master's degree programs and still others serve only as members of examining committees or merely instructors of courses carrying graduate credit.

The School of Public Health does not offer a Doctor of Public Health degree, chosing to concentrate on the Doctor of Philosophy in the foregoing fields. In this decision the School has felt that in its doctorate programs it must meet the standards established elsewhere throughout the University for doctoral degrees. Failing to do so would mean that Public Health would not be accorded the same academic stature as is instruction in other disciplines throughout the University. The Doctor of Public Health degree as it is administered in other schools, is, in the estimate of the School, set on a distinct lower level of achievement than is the Doctor of Philosophy degree. The School realizes that in its adherence to this policy, which means that the usual period of study extends from three to five years beyond the Master's degree, it is turning away students who in other institutions could obtain a Doctor of Public Health degree in two and in some instances only one year beyond the Master's degree. The School of Public Health at Minnesota is the only one of the 15 accredited schools in the United States that has adhered so rigidly to this policy of doctoral programs conforming to the higher standards of the Ph.D. degree.

Section G-2 - Organization of Academic Year

The University operates on the quarter system. The Fall, Winter, and Spring Quarters, each of between 10 and 11 weeks duration, constitute the "regular" academic year. The Summer Session is divided into two terms of five weeks each. Graduations are held at the end of each quarter of the "regular" academic year and at the end of each term of Summer Session. The degree programs in the School of Public Health consist of orderly sequences, the courses of various quarters after the first depending on work of the preceding quarter or term. The programs in biometry, hospital administration and public health nursing begin with the fall quarter and extend through two academic years. All others begin with the second term of the Summer Session and continue without interruption (except for Christmas and Spring holidays) through the Spring Quarter, and in some cases for variable additional periods. Students who are not degree candidates but desire to elect individual courses on a part-time basis are admitted as Adult Special students at the beginning of any quarter or summer term.

Section G-3 - Evaluation

Except in the programs in hospital administration and environmental health, evaluation of the teaching program is on an informal basis through conference with students, former students and directors of agencies employing the School's graduates. The Division of Hospital Administration each year conducts two 1-2 day evaluation sessions, one with the clinical preceptors who receive students for their residency year, the other with a group of the secretaries of current and former classes. The Division of Environmental Health during each of the past two years has conducted a two-day evaluation session with the directors of the environmental health division of 10-15 state health departments and representatives of the Public Health Service.

PROGRAMS IN BIOMETRY

Basic philosophy. The basic function of the Division of Biometry is to provide instruction and training in the application of statistical and mathematical techniques to the study of biologic phenomena. Biometry is conceived of as an interdisciplinary field in the biological and health sciences, interrelating mathematics, computer science and statistics in the study of quantitative concepts and research procedures of the biological sciences.

The recent and elaborate instrumentation of the laboratory and the enormous quantity of clinical and field observations have produced large amounts of data on biologic phenomena with a resultant need for methods and techniques for analysis.

The theoretical bases for these techniques of analysis are established by mathematical statistics. For problems involving extensive computation, the widespread establishment of computers in medical centers has made available virtually unlimited technical means for solution.

Biometry is conceived as consisting of three components.

a) Mathematical Biology is that aspect of Biometry concerned with development of formal probability and mathematical models for various biologic phenomena. For well over one hundred years the mathematical physicist has constructed models for phenomena in the physical sciences. Only relatively recently have mathematical theories appeared in biology. Among such has been formulation of a mathematical analysis for the circulatory blood flows that correspond to observed dilutions of injected dyes and development of the theory of interaction of species in terms of mathematical models of the process of competition for food. Similarly with recent findings in the biological sciences at the micro-unit level

of phenomena, mathematical theories have appeared for the transport of ions through membranes, probability models for (i) cell division, (ii) growth of cell populations, and (iii) cell differentiation and the development of form or pattern in the adult species.

b) Biomedical Computing is that area of Biometry concerned with data processing. In addition to usual data analysis, it includes acquisition, storage, retrieval and transmission of information. These four aspects are combined in many on-line activities of data processing. In these projects, discrete and continuous signals from biologic systems are received, immediately analyzed, and returned to the biologist or physician for the monitoring of the processes. Projects currently under development at the University include the monitoring of a patient in the operating room and the development of a large hospital data system on tape, and its updating as new patient-information becomes available.

c) Biostatistics is thought of as that area of Biometry concerned with the collection, classification and scientific evaluation of data in the life sciences. The central problem in biostatistics is inference from incomplete information. During the past fifty years, a large body of mathematical theory for inference has been developed to provide a logical basis for drawing scientific conclusions when less than complete certainty is possible. For example, with the application of this theory, accurate predictions concerning the efficacy of a treatment can be made after treating only a relatively small number of patients.

Programs of Study. Curriculum offerings of the program in Biometry at the University of Minnesota emphasize the three foregoing areas of study. With the renaming of the major (formerly Biostatistics), and the broadening of course offerings, the Biometry degree provides strong preparation for

the student who is interested in both mathematics and biology, and wants to combine these interests for a broad education in the life sciences.

I. Undergraduate Program

Serving as a Department in the College of Liberal Arts, the Division of Biometry offers a major to students seeking the B.A. degree. The prerequisites for the major are one year each of biology, calculus, chemistry, and physics. The requirements for the major include

a) 15 quarter credits in Biostatistical Theory and Technique

b) 9 quarter credits in Biomedical Computer Science

c) 9 quarter credits in Mathematical Biology

d) 9 quarter credits in Mathematical Statistics

At present, the Division has ten undergraduates majoring in Biometry, seven of whom are prospective graduate students. Three, who are likely to graduate summa cum laude, hope later to combine the Ph.D. degree in Biometry with the M.D. degree.

II. Graduate Programs Leading to M.S. and Ph.D. Degrees

Introduction. Graduate training in Biometry at the University of Minnesota has expanded from a program devoted solely to Biostatistics in 1950, with a small faculty and student body, to a program that today emphasizes Mathematical Biology and Biomedical Computing, in addition to Biostatistics. The program, offering both the M.S. and the Ph.D. degree, has thus grown and developed during the past twenty years into a source of well prepared and capable biometricians.

The Curriculum. Prerequisites. Prerequisite to graduate work in Biometry at Minnesota is successful completion of an undergraduate major in science or mathematics, including basic courses in calculus, statistics, physics, chemistry and biology.

Biometry Courses Available for Graduate Students. The existing graduate curriculum is composed of the courses in Biometry listed below, plus certain additional courses. These supplementary courses, presented below after the Biometry courses, are drawn mainly from four areas: (i) Basic Biomedical Sciences, (ii) Public Health, (iii) Mathematics, and (iv) Statistics. (All courses given here are officially listed in the 1968-70 Graduate School Bulletin and the 1968-70 School of Public Health Bulletin. As Biometry is a part of the School of Public Health, all Biometry courses carry a Public Health number, regardless of content.)

The Biometry courses are:

Public Health 110A.	BIOMETRY I. Basic concepts in probability; binomial, Poisson, and normal probability models; testing statistical hypotheses and estimation of parameters of probability models.
Public Health 111A.	BIOMETRY LABORATORY I. Application of concepts of probability to the development of probability models for random phenomena in the biological and medical sciences.
Public Health 110B.	BIOMETRY II. Further consideration of testing statistical hypotheses and interval estimation; regression analysis; correlation; use of ratios; analysis of variance; contrasts and multiple comparison techniques.
Public Health 111B.	BIOMETRY LABORATORY II. Application of concepts of testing and estimation concerning the parameters of the basic probability models; application of regression to bioassay; examples of the use and misuse of ratios; application of analysis of variance to bioassay.
Public Health 110C.	BIOMETRY III. Analysis of randomized block, factorial, and split plot designs; χ^2 applied to frequency data; multiple regression.
Public Health 111C.	BIOMETRY LABORATORY III. Basic designs will be illustrated with numerous examples from the biological sciences; application of χ^2 to goodness of fit and heterogeniety tests.

Public Health 120A-B-C. **BIOMEDICAL COMPUTING.** Introduction to data processing concepts and equipment; information storage and retrieval; statistical analysis packages; dynamic programming; special input/output techniques for biological laboratory experimentation, epidemiology, hospital information systems, and pattern recognition.

Public Health 120D-E. **BIOMEDICAL COMPUTING.** Introduction to digital computer and FORTRAN programming with applications in biology and medicine.

Public Health 121A-B-C. **QUANTITATIVE MAMMALIAN BIOLOGY.** A: Diffusion, surface tension, and mechanics of respiration, circulation, digestion, and locomotion. B. Chemical aspects of blood, respiration, renal function, nutrition, and metabolism. C. Endocrine, sensory, neuromuscular, and central neural functioning.

Public Health 124A. **RESEARCH METHODS IN CLINICAL STUDIES.** Design, conduct, and analysis of clinical studies; prophylactic trials; therapeutic trials; validity and reliability of measurements and calibration studies for clinical setting; sensitivity and specificity of tests and their application in clinical research and diagnosis. Special problems of cooperative studies.

Public Health 144. **HISTORY OF BIOMETRY.** Development of probability theory and systems for collection of vital statistics; early application to life tables, medical, and biological problems; biographies of men important in development.

Public Health 150A. **HEALTH STATISTICS I: STATISTICS FOR HEALTH PLANNING AND ADMINISTRATION.** Sources of data on health. Summarization procedures used in vital statistics. Methods of data collection. Morbidity surveys.

Public Health 150B. **HEALTH STATISTICS II: STATISTICAL TOPICS IN EPIDEMIOLOGY.** Relative risk; misclassification; matched pairs designs; incidence as a function of several variables; selection; familial aggregation.

Public Health 150C. **HEALTH STATISTICS III: STATISTICS ON SURVIVORSHIP.** Mathematical development of life table techniques and their application to follow-up studies in medicine and public health.

Public Health 197A-B-C.	ELEMENTS OF MATHEMATICAL BIOLOGY. Physico-, chemico-, mathematical biology; statics and dynamics of tissues and fluids; biological reaction and compartment analysis, ion diffusions, and colloids; analog and digital computer used in bio-medicine.
Public Health 200.	RESEARCH. Opportunities are offered by the School of Public Health and by various cooperating organizations for qualified students to pursue research work.
Public Health 201.	TOPICS IN BIOMETRY. Studies in special topics for advanced students.
Public Health 203A-B-C.	RESEARCH DESIGN IN BIOMETRY. Methodology of design of experiments and sample surveys in behavioral and biological sciences; randomized blocks, Latin-squares, factorials, incomplete blocks, long-term experiments and analysis of groups of experiments; simple random, stratified, multistage, and multi-phase sampling designs.
Public Health 204A-B-C.	THEORY OF RESEARCH DESIGN IN BIOMETRY. Theory of linear estimation and general linear hypothesis; analysis of multiple classifications; components of variance; randomization theory of designs.
Public Health 211.	SEMINAR: BIOMETRY.
Public Health 216A-B.	BIOMEDICAL MEASUREMENT PROBLEMS. Statistical aspects of biological assays and counting techniques, calibration problems, quality control procedures.
Public Health 217A-B.	THEORY FOR BIOMEDICAL MEASUREMENT PROBLEMS.
Public Health 250A-B-C.	FOUNDATIONS OF BIOMETRY. Measurement models, theories of probability, logic of induction, alternative theories of inference.

Supplementary Courses elected most frequently by graduate students include

i) Biomedical Sciences

Anatomy 100-101.	GROSS HUMAN ANATOMY.
Biochemistry 100-101.	BIOCHEMISTRY.
Genetics and Cell Biology 175.	HUMAN GENETICS.
Microbiology 153.	BIOLOGY OF MICROORGANISMS.
Physiology 106-107.	HUMAN PHYSIOLOGY.

ii) Public Health

Public Health 100A.	ELEMENTS OF PUBLIC HEALTH I.
Public Health 104.	EPIDEMIOLOGY I.
Public Health 105.	EPIDEMIOLOGY II.
Public Health 241.	EPIDEMIOLOGY OF NONCOMMUNICABLE DISEASES.

iii) Mathematics

Mathematics 142-143.	VECTOR AND MATRIX THEORY WITH APPLICATIONS.
Mathematics 148.	DIFFERENTIAL EQUATIONS.
Mathematics 151.	ADVANCED CALCULUS I.
Mathematics 153.	ADVANCED CALCULUS II.
Mathematics 178A-B-C.	PROBABILITY.

iv) Statistics

Statistics 131-132-133.	THEORY OF STATISTICS.
Statistics 144-145.	THEORY OF SAMPLE SURVEYS.
Statistics 191-192-193.	ANALYSIS AND DESIGN OF EXPERIMENTS.
Statistics 201-202-203.	THEORY OF STATISTICAL INFERENCE.

Plans of Study. The initial educational objective is to guide each entering graduate student through the requirements of the M.S. degree in Biometry. (Exception is made in the case of the occasional student who enters already having a Masters degree and who is able to proceed directly to advanced work.) These initial requirements will ordinarily include at least one quarter of the Seminar, P.H. 211, in addition to courses in the following four areas:

a) Biostatistical Theory and Technique (Biometry I, II, III--P.H. 110A-B-C, Biometry Laboratory I, II, III--P.H. 111A-B-C);

b) Biomedical Computer Science (Biomedical Computing--P.H. 120A-B-C);

c) Mathematical Biology (Quantitative Mammalian Biology--P.H. 121A-B-C); or Public Health (Elements of Public Health I--P.H. 100A and Epidemiology I and II--P.H. 104, 105);

d) Mathematical Statistics (Theory of Statistics--Statistics 131-132-133).

In addition to further course work, the M.S. degree (Plan B--without thesis) requires the preparation of three written reports under faculty supervision. The M.S. (Plan A), selected by relatively few students, requires the submission of a thesis.

A final prominent feature of this initial educational objective is teaching experience. All candidates are provided opportunities to assist in the laboratories of P.H. 90 (Medical Statistics) as well as in P.H. 111A-B-C, P.H. 140 (Vital Statistics) and P.H. 180 (Introduction to Biometry) for one or two quarters per year. A substantial number of our graduates are presently engaged in University teaching.

The Ph.D. student in Biometry, having built upon a standard curriculum in his work for the M.S., proceeds to more intensive study, carefully tailor-made to his major interests. Depending upon these interests and his adviser, he will specialize in Biostatistical Inference (including Health Statistics and Epidemiology), or in Mathematical Biology or in Biomedical Computer Science--fields in which the trainee will be qualified upon completion of training.

The doctoral dissertation in Biometry emphasizes some subset or combination of these three fields.

Summary of Advanced Degrees in Biometry 1950-1968.

The Number of M.S. and Ph.D. Degrees

Awarded in Biometry, 1950-1968

	M.S.		Ph.D.	
Period	Total Number	Number per Year	Total Number	Number per Year
1950-1954	5	1.	0	-
1955-1959	11	2.2	2	.4
1960-1964	22	4.4	10	2.0
1965-1968	27	6.75	10	2.5
Totals	65		22	

During this 19-year period the average number of advanced degrees in Biometry awarded annually has increased more than six fold. This is true for students receiving either the M.S. degree or the Ph.D. degree.

The proportion of M.S. degree students who have received the doctorate or who are currently working for the doctorate is given in the table below.

Number of Students Who Received M.S. in Biometry

Who Continued for Ph.D. in Biometry, 1950-1968

Year M.S. Awarded	Ph.D. Awarded or Current Ph.D. Candidate	Did Not Continue for Ph.D.	M.S. Total
1950-1954	4	1	5
1955-1959	7	4	11
1960-1964	8	14	22
1965-1968	15	12	27
Totals	34	31	65

The fraction of students who have continued for the doctorate has increased from one out of five in the early years to approximately one half currently. The figure of one half for the present is an underestimate due to incompleteness of period of observations for such reasons as students being drafted at the end of one or two years of graduate study.

III. Master of Public Health Program

A previous program for Vital Statisticians has recently been revised with emphasis on health statistics. The purpose of this program is to train statisticians at the Master's degree level for health agency positions. Students in this program become acquainted with public health problems and organization, and become familiar with statistical data sources, statistical procedures and computer methods. It is expected that these graduates will develop and implement plans for collecting and using data for planning and evaluating health related programs.

Course work normally includes

Public Health 100A-B-C.	ELEMENTS OF PUBLIC HEALTH I, II, III.
Public Health 102.	ENVIRONMENTAL HEALTH.
Public Health 104.	EPIDEMIOLOGY I.
Public Health 106.	PUBLIC HEALTH ADMINISTRATION.
Public Health 120A-B-C.	BIOMEDICAL COMPUTING.
Public Health 125.	INTRODUCTION TO PUBLIC HEALTH EDUCATION.
Public Health 150A-B-C.	HEALTH STATISTICS I, II, III.
Public Health 170A.	ADMINISTRATION OF PUBLIC HEALTH NURSING.
Public Health 210.	SEMINAR: PUBLIC HEALTH.

The foregoing courses are supplemented by electives in statistics or other health related topics.

Facilities particularly important to this program are the Biomedical Data Processing Center with its CDC 3300 computer and the Vital Statistics Section of the Minnesota State Department of Health which, as of February 1969, is located only two blocks from the Biometry Division and School of Public Health. Mr. Robert Hiller, Chief of this Section is a Lecturer in this program.

IV. Biometry in Relation to the Other Units of the Health Sciences Center

The Health Sciences Center of the University includes: the College of Pharmacy, the School of Dentistry, and the College of Medical Sciences. In this Center, Biometry is located within the School of Public Health which itself is a unit--collateral with the Medical School, the School of Nursing, and University Hospitals--within the College of Medical Sciences.

The position within the College of Medical Sciences and the Health Sciences Center places teaching and research responsibility in the field of Biometry solely on this Division. It therefore provides numerous opportunities for fruitful collaboration and consultation with the many units of the Health Sciences Center.

In this joint health research effort, the collective activity of the Biometry faculty is formally designated the Biometry Consulting Laboratory. In addition to contributing to ongoing research in the Health Sciences Center, the Biometry Consulting Laboratory serves an essential "internship" function for Ph.D. students in Biometry. Thus opportunity is given advanced graduate students to interact with the biomedical scientist after the latter has presented his problem to a consulting biometrician, a Biometry faculty member. Responsibility for appropriate technical advice is taken by the professor of Biometry who offers guidance to the students, assisting them to develop rapport and skill in understanding the problem and in entering into successful collaboration with the scientists.

V. Biometry Courses Offered as a Service for Medical and Public Health Students

All students in medicine and the several professional programs in the School of Public Health are required to take at least one course in biometry. The alternative courses and the different groups for which they are designed are as follows.

Public Health 90. MEDICAL STATISTICS I. Frequency proportions and probability; rates, measured variables; chance variation and judgment of significance; association. (sophomore medical students)

Public Health 108. INTRODUCTION TO BIOSTATISTICS AND STATISTICAL DECISION. Variation, frequency distribution; probability; significance tests; estimation; trends; data handling; simple operations research applications; statistical approach to rational administrative decision making. Lectures and laboratory exercises. (students in hospital administration)

Public Health 124. **MEDICAL STATISTICS II.** Survey of biostatistics for dentists and physicians; elementary statistical methods and their application with emphasis on dental and medical research and appreciation of the research literature; examples taken from recent dental and medical journals. (graduate physicians and dentists)

Public Health 140. **VITAL STATISTICS I.** Official sources; population changes; rates; trends; significant differences. (health officer, veterinarian, P.H. dentists, P.H. nurses, nutritionists and health educators)

Public Health 140A. **VITAL STATISTICS II.** Demographic techniques and statistical inference for public health majors. (health officer, veterinarian, P.H. dentists, P.H. nurses, nutritionists and health educators)

Public Health 180. **INTRODUCTION TO BIOMETRY.** Variation; frequency distribution; probability; estimation; significance tests; binomial, normal, Poisson distributions; serial dilutions; most probable number. (students in environmental health)

PROGRAM IN DENTAL HEALTH

For a number of years the School has had an occasional dentist working for a Master of Public Health degree who followed a program of study very comparable to that of physicians on the Health Officer program but differing only by the choice of electives. The electives available within the strictly dental field were quite restricted as the School of Dentistry was at that time giving little attention to the field of preventive dentistry. The students did, however, have rather close supervision from Dr. William Jordan, Director of the Program in Dental Health of the Minnesota State Health Department, offices of which are located on the Campus. These students thus had a more individualized tutorial type of program than was provided in other parts of the School.

During the past four or five years, however, the Dental School, as a part of a rather major overhaul in its curriculum, has developed a department of preventive dentistry under the title of Human Ecology. The dentist in charge of this program has completed both an MPH and Ph.D. program in Epidemiology in the School of Public Health. His associate has completed a MPH degree and before returning to the University, had been Director of the Division of Dental Health for the State of New Mexico. Two persons in Public Relations, one with a Ph.D. in Communications and the other an MPH in Health Education from Minnesota, complete this Department in the Dental School. All four of these have joint appointment in the School of Public Health.

This fairly recent development in the School of Dentistry has made it possible for the School of Public Health to develop a more active and comprehensive program for dentists interested in training for public health

work in that new courses of particular applicability have been developed and the work of the students has been more closely supervised by full-time University staff. At the same time it has provided a more active program of instruction in health for the students in the Dental School working on their basic professional training.

As a consequence of these developments, the number of dentists enrolled in the School of Public Health has increased and the School is receiving a very much larger number of applications from which selection of suitable students can be made. Those who are accepted continue on a program which includes the core courses requisite for the MPH degree, additional public health electives of a general nature, supplemented by the aforementioned special courses in dental health. In planning the program for this group of dentists, the School has had to assume that in their dental training they have had very little if any consideration to either preventive medicine or the preventive aspects of dental health, a subject that is not well taught in most schools of dentistry. Students can include among their electives courses offered through other parts of the University, such as the departments of Public Administration, Sociology and Anthropology which have a wide variety of offerings that would supplement what is normally a weak background in social sciences on the part of dental school graduates.

The special courses developed for the dental health program are as follows:

Public Health 182. Philosophy and Concepts of Preventive Dentistry. Basic principles of preventive dentistry, relationship between oral and general disease processes; epidemiology of oral diseases; preventive procedures; organizing and evaluating community dental health programs.

Public Health 183. Seminar: Dental Health Literature. Current review of literature pertinent to dental public health, critical examination for design, content, and validity of conclusions.

Public Health 184. Dental Health Programs. Dental health activities and problems in a community situation; observation visits and participation in public and voluntary facilities; preventive, curative, rehabilitative, and research activities of local, state, and federal agencies; problems of dental manpower.

The following table shows a typical program of study leading to the MPH degree:

II Summer Session

Public Health 100A	Elements of Public Health I
Public Health 107	Maternal and Child Health
Public Health 230	Field Practice in Environmental Health

Fall Quarter

Public Health 114	Environmental Health Programs
Public Health 125	Introduction to Public Health Education
Public Health 140	Vital Statistics I
Public Health 183	Seminar: Dental Health Literature
Public Health 215	Maternal and Child Health Problems
Public Admin. 210	Seminar: Public Health
Anthropology 101	Principles of Bio-cultural Evolution

Winter Quarter

Public Health 100B	Elements of Public Health II
Public Health 104	Epidemiology I
Public Health 106	Public Health Administration
Public Health 123	Topics in Public Health
Public Health 170	Administration of Public Health Nursing
Public Health 183	Seminar: Dental Health Literature
Public Health 184	Dental Health Programs

Spring Quarter

Public Health 100C	Elements of Public Health III
Public Health 105	Epidemiology II
Public Health 122	Public Health Administration Problems
Public Health 133	Mental Health
Public Health 182	Philosophy and Concepts of Preventive Dentistry
Public Health 183	Seminar: Dental Health Literature
Public Health 241	Epidemiology of Noncommunicable Diseases

PROGRAMS IN ENVIRONMENTAL HEALTH

The School of Public Health has been active from its very beginning in providing instruction in environmental health for the many categories of personnel involved in such programs throughout the world. To date more than 500 individuals majoring in environmental health (exclusive of short term training) have been enrolled in its various programs. At the same time, the Division of Environmental Health has provided instruction (formerly designated as "sanitation") to various other professional groups both within the School of Public Health and in other parts of the University. A course in environmental health is required as a part of the core for both the M.P.H. and the M.H.A. degrees, and is elected by students from a wide variety of disciplines such as Civil or Chemical Engineering, Food Science and Industries, Dairy Husbandry, and Microbiology. Courses developed for this purpose are:

> Public Health 75A - Introduction to Environmental Health. Principles of environmental health relating to water, food, wastes, housing, accidents, radiation, air, industrial hygiene. Required of all students in Pharmacy.
>
> Public Health 102A - Environmental Health. General principles of urban and rural sanitation; problems encountered by official health agencies. Designed for graduate students in Health Education, Public Health Nursing and Public Health Nutrition.
>
> Public Health 109 - Institutional Environmental Health. Sanitation and safety practices in hospitals and other institutions. Designed for graduate students in Hospital Administration, placing emphasis on institutional problems.
>
> Public Health 114 - Environmental Health Programs. Public health supervision of activities in urban and rural sanitation. Designed for physicians, dentists, and veterinarians in MPH programs, placing emphasis on community problems and programs.

Programs of graduate study majoring in environmental health may lead to the M.P.H., M.S. or Ph.D. degrees. Students seeking a Master's degree usually present a background of engineering, biology, chemistry or physics and, in a high proportion of cases, have had several years of practical experience before

undertaking graduate study. In recent years there has been an increasing number of younger applicants who are just completing bachelor's degree programs in a physical or biological science and wish to concentrate in such areas as air pollution or radiological health. Some extremely able students have been recruited to a public health career from this group of applicants. Doctoral degree programs are offered through the Graduate School and have attracted a growing number of students who, after completing their Master's degree program in Environmental Health, wish to study further in one of the specialized fields such as air pollution, radiological health or environmental biology.

Initially, and continuing to the present day, it has been the philosophy and practice of the environmental health faculty, in its programs for students specializing in environmental health, to be concerned with the "generalist"--the engineers and sanitarians employed by federal, state and local public health agencies who have need for graduate study in order to perform their duties better. By taking advantage of the course offerings of many colleges and departments throughout the University, it is possible for such personnel to receive excellent instruction whatever their needs may be. These offerings, together with the wide range of courses available from the environmental health faculty, permit the generalist to prepare himself in the areas of water supply, sewerage, solid wastes, occupational health, insect and rodent control, food sanitation, environmental microbiology, institutional sanitation and administration. Courses of broad interest to the "generalist" in environmental health include the following:

> Public Health 102 - Environmental Health. Methods for promoting man's health and comfort by controlling the environment.
>
> Public Health 112 - Environmental Aspects of Water Systems. Sanitary aspects of design and operation of water treatment and distribution systems; examination of plans and field investigations.

Public Health 113 - Environmental Aspects of Liquid Waste Systems. Sanitary aspects of design and operation of liquid waste treatment and collection systems; examination of plans and field investigations.

Public Health 115 - Food Sanitation. Review of current literature on sanitary problems in production, processing, and distribution of milk, meat, shellfish, and other foods; methods of supervision.

Public Health 116 - Administration of Environmental Health Programs. Administrative organization of environmental health activities.

Public Health 117A,B,C - Environmental Biology. Plant and animal forms important in environmental health with special reference to disease vectors, eutrophication, and water supply problems.

Public Health 118 - Environmental Microbiology. Survival, dissemination, transportation and significance of microorganisms in the environment; application of principles to environmental health problems.

Public Health 147 - Environmental Radioactivity. Measurement, evaluation, and control of environmental radioactivity; hazards to general population.

Public Health 149 - Public Health Aspects of Housing and the Residential Environment. Principles of healthful housing; application in community planning and development.

Public Health 152 - Industrial Hygiene Engineering. Field and laboratory methods used by industrial hygiene engineers in study and control of occupational health hazards.

Public Health 153 - Principles and Methods of Accident Prevention. Accidents as a community public health problem; current concepts of etiology and methodology of control.

Public Health 155 - Introduction to the Air Pollution Problem. History, sources, controls, effects, surveys, legal aspects; administration of programs.

Public Health 212 - Seminar: Environmental Health.

Since World War II, the School has been concerned, also, with the need to prepare "specialists" for a number of major environmental health programs that have evolved in the last two decades. Descriptions of these specialty programs follow:

Accident Prevention

The purpose of this program is to provide professional competency in the

specialized area of injury control for personnel currently employed in or planning to enter the field of public health. Graduates of this program obtain a general knowledge of public health problems and organization supplemented by special study of injury control methods and procedures that are or can be integral parts of public health activities. The curriculum is designed to include instruction in such areas as institutional and industrial safety, laboratory safety, principles of accident prevention and injury control, and toxicology (offered through the Department of Pharmacology in the Medical School). Special tutorial work can also be arranged to study other problem areas. Additional course work in the areas of epidemiology, biometry, community planning and organization, human behavior, health education, environmental controls, civil engineering and public administration may be selected to meet the special interests or needs of the student. The University Health Service, through its Division of Environmental Health and Safety, key staff of which have concurrent teaching appointments with the Environmental Health Division of the School of Public Health, conducts an active campus safety program for the University's faculty and student body. The physical plants of the University and the University Hospitals are available for full-scale injury control laboratories. The intramural sports program of the University provides a setting to study injury control problems associated with sports. Formal courses in accident prevention include the following:

Public Health 152 - Industrial Hygiene Engineering. Field and laboratory methods used by industrial hygiene engineers in study and control of occupational health hazards.

Public Health 153 - Principles and Methods of Accident Prevention. Accidents as a community public health problem; current concepts of etiology and methodology of control.

Public Health 154 - Special Studies in Accident Prevention. Directed readings and reports on selected problem areas in accident prevention and injury control.

Public Health 158 - Hospital Safety. Theories and practices in accident and fire prevention and control for hospitals and other medical care facilities.

Public Health 159 - Chemical Laboratory Safety. Principles of accident and fire prevention in chemical laboratories.

A typical program of study is as follows:

Pub.H. 100A,B,C - Elements of Public Health
Pub.H. 102 - Environmental Health
Pub.H. 104 - Epidemiology I
Pub.H. 106 - Public Health Administration
Pub.H. 125 - Introduction to Public Health Education
Pub.H. 152 - Industrial Hygiene Engineering
Pub.H. 153 - Principles and Methods of Accident Prevention
Pub.H. 154 - Special Studies in Accident Prevention
Pub.H. 158 - Hospital Safety
Pub.H. 159 - Chemical Laboratory Safety
Pub.H. 170A - Administration of Public Health Nursing
Pub.H. 180 - Introduction to Biometry
Pub.H. 210 - Seminar: Public Health
Pub.H. 212 - Seminar: Environmental Health
Pub.H. 230 - Field Practice in Environmental Health
Pub.H. 105 - Epidemiology II
Pub.H. 110A,B,C - Biometry
Pub.H. 111A,B,C - Biometry Laboratory
Pub.H. 118 - Environmental Microbiology
Pub.H. 120A,B,C - Biomedical Computing
Pub.H. 126 - Occupational Health Programs
Pub.H. 127 - Advanced Studies in Health Education
Pub.H. 147 - Environmental Radioactivity
Pub.H. 241 - Epidemiology of Noncommunicable Diseases
C.E. 156 - Highway Traffic Engineering
I.E. 182 - Industrial Safety
P.A. 228 - Housing, Community Facilities for Aging
P.A. 247 - Urban Development
Phcl. 106 - Toxicology
Psy. 148 - Fundamentals of Physiological Psychology
Psy. 260 - Seminar: Industrial, Organizational Psychology

Air Pollution

Specialized training in air pollution and its control is available for students with a Bachelor's degree in civil, chemical, or mechanical engineering, chemistry, physics, and certain biological sciences with strength in mathematics and chemistry. Each program is patterned to the student's academic background with elective courses in particle technology, physics of the atmo-

sphere, meteorology, toxicology, and graduate courses in chemistry, physics, and chemical engineering. Each student in the air pollution training program receives instruction on the management of air pollution control programs, design and operation of air sampling networks, theory and operation of air sampling equipment and of control methods and equipment. The student also participates in group solutions to assigned problems involving air pollution control and in giving instruction when feasible.

Special courses offered through the School of Public Health and identifiable as concerned with air pollution problems are as follows:

> Public Health 151 - Health Aspects of Air Control in Hospitals. Basic considerations in control of natural and mechanical air flow in hospitals to avoid spread of infection, to control odors, and to promote patient care.
>
> Public Health 155 - Introduction to the Air Pollution Problem. History, sources, controls, effects, surveys, legal aspects; administration of programs.
>
> Public Health 156 - Air Pollution Controls and Surveys. Public Health engineering approach to air pollution controls and surveys.
>
> Public Health 185 - Air Analysis. Laboratory and field exercises including air flow measurement, calibration of instruments, analysis of gases, stack sampling, dust counting and sizing, and industrial plant visits.
>
> Public Health 186 - Problems of Air Pollution Control. Special supervised studies involving laboratory and field investigation procedures; pertinent literature review.

Public Health 155 and 156 have in certain years been offered also in the evening through the University Extension Division, thus serving a group of potential students who, because of their employment during the day, cannot otherwise avail themselves of these courses.

A typical Master's degree program with concentration on air pollution encompasses the following with minor deviation to accommodate special professional interests of individual students:

Pub.H. 100A,B,C - Elements of Public Health
Pub.H. 102 - Environmental Health
Pub.H. 104 - Epidemiology I
Pub.H. 116 - Administration of Environmental Health Programs
Pub.H. 125 - Introduction to Public Health Education
Pub.H. 155 - Introduction to the Air Pollution Problem
Pub.H. 156 - Air Pollution Controls and Surveys
Pub.H. 170A - Administration of Public Health Nursing
Pub.H. 180 - Introduction to Biometry
Pub.H. 185 - Air Analysis
Pub.H. 186 - Problems of Air Pollution Control
Pub.H. 210 - Seminar: Public Health
Pub.H. 212 - Seminar: Environmental Health
Pub.H. 230 - Field Practice in Environmental Health
Pub.H. 110A,B,C - Biometry
Pub.H. 111A,B,C - Biometry Laboratory
Pub.H. 118 - Environmental Microbiology
Pub.H. 120A,B,C - Biomedical Computing
Pub.H. 147 - Environmental Radioactivity
Pub.H. 152 - Industrial Hygiene Engineering
Pub.H. 241 - Epidemiology of Noncommunicable Diseases
Bio.C. 151-2 - Introduction to Biochemistry
M.E. 183-4 - Principles of Particle Technology
Phcl. 106 - Toxicology

In the research area the air pollution training program has been active in three major projects for several years. A health-effects study has been underway involving the relationship between certain air pollutants originating from local industry and bronchial asthma. Another research project involves the characterization of particulate pollution in an urban area. A television tower has been instrumented for meteorologic measurements and for particle size, concentration and identity determinations. A third area of study has developed in the sampling and analysis of gaseous air pollutants, mainly those of higher molecular weights and having odor properties. Instrumentation has included freeze-out traps for sampling and gas, thin layer and paper chromatography and infrared spectrophotometry for analysis. Research training for students has been conducted in the three project areas listed.

The air pollution training program has been involved with local and state officials in promoting air pollution control in the Twin City Metropolitan area and throughout the State of Minnesota. Over a period of several years service

to the community has included meetings with civic groups, professional societies and schools, special training of local control program personnel, direction and advice to local control programs and to industry, and service on various federal, state and local committees concerned with the air pollution problem.

Environmental Biology

Courses in environmental ("sanitary") biology are provided for students in environmental health whose professional background (usually engineering) is deficient in biology. These courses are designed to give the student an introduction to biologic processes and procedures that are essential to his understanding of environmental control programs. For many engineers, even those with several years of public health experience, this is the first exposure to the biological knowledge and concepts that are fundamental to his work. With few exceptions the engineer who lacks an adequate biologic background is required to take one or more of the courses in environmental biology as a part of his Master's degree program.

For the student with a special interest in the biological aspects of environmental problems the School offers an interdepartmental interdisciplinary program that provides instruction at both Master's and Doctoral levels. At the present time eleven doctoral students are in this program. Training provided for these individuals includes such areas as water supply biology, vector control, biological problems of waste disposal, and biological aspects related to air pollution, food sanitation and housing. Training of doctoral students is supplemented by courses in other departments of the University including Biochemistry, Botany, Entomology, Microbiology, Food Sciences and Industries and Zoology. Courses in environmental biology offered through the School of Public Health include the following:

Public Health 115 - Food Sanitation. Review of current literature on sanitary problems in production, processing, and distribution of milk, meat, shellfish, and other foods; methods of supervision.

Public Health 117A,B,C - Environmental Biology. Plant and animal forms important in environmental health with special reference to disease vectors, eutrophication, and water supply problems.

Public Health 118 - Environmental Microbiology. Survival, dissemination, transportation and significance of microorganisms in the environment; application of principles to environmental health problems.

Public Health 200 - Research. Opportunities will be offered by the School of Public Health and by various cooperating organizations for qualified students to pursue research work.

Public Health 233 - Water Quality Investigation and Research Techniques. Field techniques and special research methods for establishing pollution base-lines; recognition and appraisal of advancing eutrophication.

Public Health 234 - Water Quality Research. Design and implementation of independent short-term research activity. Literature review, statistical design, and data processing.

Research training in environmental biology involves the students in investigations that cover a variety of problems of concern to public health. In some instances the research deals directly with problems of human health, while in others the investigations are directed toward determinations of man's influence on the earth environment and biosphere.

Among the research studies, there are a number that are concerned with problems of water quality and water pollution biology -- studies made possible through the facilities of the School's Limnological Research Station located at the Duluth campus of the University and operated jointly with the Department of Biology at Duluth. These projects include carbon-14 analysis of phytoplankton productivity as a means for estimating eutrophication, chlorophyll and carotenoid pigment analysis of periphyton organisms, microscopic studies of algae, algal cultures and bioassay studies, and investigations of zooplankton organisms in the Great Lakes. Investigations by other doctoral students deal

with problems ranging from special virus studies to research in toxin production by algae.

In addition to the regular academic year teaching program, graduate level courses entitled, "Water Quality Investigations and Research Techniques," are taught during both summer session terms at the Limnological Research Station located on the shore of Lake Superior at Duluth. These courses are the logical outgrowth of the School's long range summer programs of research as to the biology of Lake Superior, a program of studies initiated in 1955 and continued each succeeding summer on an expanded scale. Starting as a small 2-3 man team for summer research to obtain background data for future pollution studies, this program has expanded into a combined research and research-training program that during the past five years has attracted students from 17 states and 2 foreign countries, as well as numerous visitors. The summer program includes three separate courses (PH 233, PH 234 and PH 200). Approximately 10-15 students are registered for these courses each year. The staff also provide an opportunity for visiting scientists to participate in the ongoing programs of research and training. The recent construction of the Department of the Interior's Fresh Water Quality Laboratory on adjoining land provided added opportunity for collaborative research and research-training.

Hospital Engineering

Nearly ten years ago the School of Public Health recognized that the nation's hospitals and related medical facilities presented problems of environmental health and safety that were unique, and that personnel were needed that were trained to cope with such special environmental problems. Recent developments in medical science as well as in the physical construction and equipment of hospitals have introduced patient hazards that either did not exist or were less severe 20 years ago. Highly complicated medical and surgical procedures,

while of unquestioned benefit to the patient, have at the same time exposed extremely susceptible persons to greater risk of infection that may be acquired from the hospital environment. This same environment with its increased instrumentation and structural complexity has become more hazardous to the patient. The mere introduction of air conditioning has immeasurably increased the movement of air throughout the hospital with resultant increased distribution of microorganisms and other particulate matter. In contrast to the simpler building of yesteryear, the modern hospital is a highly complex and potentially dangerous structure the design and operation of which present unique engineering problems. The solution of these problems requires knowledge and skills not usually possessed by those responsible for hospital maintenance. To help fill this gap the School has directed its attention to the development of instruction in hospital and institutional engineering.

The program of study has been developed to prepare graduate engineers to work in such institutions, or to work more effectively in agencies having responsibility for hospital programs. The two-year course of study leading to an M.S. or M.P.H. degree is designed to provide the hospital engineer with specialized training that will enable him to apply his skills in effective planning, administration and operation of hospitals. The program is divided into four principal areas, viz. technical engineering, public health, hospital administration, and hospital environmental engineering. In this latter area special attention is given to hospital services, including communications, air conditioning, heating and ventilation, illumination, noise control, food services, safety, disinfection, cleaning and laundry practices, as well as the control of transfer of infectious and toxic agents. Courses in civil, electrical, industrial and mechanical engineering, architecture, microbiology, and hospital administration can also be selected to tailor the program to the needs of the individual student and his agency or institution. The following special

courses have been developed for this program and serve as electives for other students:

> Public Health 115A - Institutional Food Protection Program. Public Health implications in food preparation and service; regulatory controls by official public health agencies.
>
> Public Health 138 - Hospital Engineering Problems. Application of environmental engineering, sanitation and maintenance principles to planning, administration, and operation of hospitals.
>
> Public Health 151 - Health Aspects of Air Control in Hospitals. Basic considerations in control of natural and mechanical air flow in hospitals to avoid spread of infection, to control odors, and to promote patient care.
>
> Public Health 157 - Radiation Protection Criteria for Hospitals. Methods of design, shielding, equipping, and operation of isotope laboratories, X-ray, and other ionizing radiation facilities.
>
> Public Health 158 - Hospital Safety. Theories and practices in accident and fire prevention and control for hospitals and other medical care facilities.
>
> Public Health 159 - Chemical Laboratory Safety. Principles of accident and fire prevention in chemical laboratories.

Enrollment in the program has been limited to date. This year four engineers are participating.

The two-year Master's degree program has been supplemented by a special summer session short course and by Extension courses. The first summer course of 5 weeks duration was developed in 1964 with the financial assistance of the American Hospital Association but in all subsequent years has been supported solely out of School of Public Health resources. To date the program has served 149 students from 33 states, District of Columbia, Guam, Puerto Rico, Canada, Colombia, Costa Rica and Denmark. These students are personnel already employed in hospitals and supported in the program by their respective institutions. During the current academic year, the School is offering two of the hospital engineering courses (Pub.H. 138 and 158) as evening courses through the University Extension Division, thus making this instruction more readily

available to hospital personnel throughout the Twin City metropolitan area. Twenty-five students have been enrolled in these courses.

The hospitals of the Twin Cities, and particularly the University Hospitals, have provided full scale teaching resources for such training. A continuing research program in hospital engineering problems has served to stimulate the staff and provide new and meaningful information for these courses. In the development of this program, the School has drawn heavily upon the experience of environmental health staff of the University Health Service, which as a part of its responsibility for control of environmental hazards throughout the campus, includes the University Hospital within its jurisdiction. Key staff of the Health Service have teaching and research appointments within the School of Public Health.

Radiological Health

The primary purposes of the training programs in radiological health are:

1. To integrate the broad spectrum of knowledge required of the health physicist into a logical pattern directed toward understanding the implications of and control methods associated with protection of man from radiation hazards;
2. To provide the training necessary to prepare students in the health sciences for responsible leadership in health agencies and health related industries;
3. To provide an opportunity to pursue a research topic in radiological health from inception to conclusion.

Broad and intensive courses are offered to prepare students for positions in professional practice, administration, and research. Opportunities for interdepartmental programs of work and study are readily arranged, particularly in such areas as physics, biophysics, radiology, and biometry. Areas of special

endeavor include internal emitters, medical uses of radiation and radionucleides, and radiation dosimetry of low energy radiation. The program of study can be adapted to any of a number of interests in view of the range of top level academic capabilities available on the closely knit campus. In formulating a program of study for students with a special interest in radiological health, full utilization is made of a wide range of courses in the departments of Biochemistry, Chemical Engineering, Physics, and Radiology.

Interdepartmental participation is regarded as an important attribute to the programs in radiological health and is consistent with the belief at the University of Minnesota that a number of environmental health problems, of which radiological health is only one, are best examined by experts in a variety of specialties.

The student has the opportunity to participate actively in the monitoring and control of potential radiation hazards throughout the University, working with members of the staff of the University Health Service who are responsible for radiological safety throughout the campus and carry teaching appointments in the School of Public Health.

Special courses in radiological health required of students specializing in this area and utilized as electives by students in other environmental health programs or from other parts of the University include the following:

Public Health 143 - Measurement and Application of Ionizing Radiation. (Same as Phcg. 169). Introduction to principles of measurement and use of radiative sources.

Public Health 145 - Low-Level Radioactivity and Radiation Measurements. Advanced isotope techniques designed for assay of low levels of radioactivity in environmental samples.

Public Health 147 - Environmental Radioactivity. Measurement, evaluation and control of environmental radioactivity; hazards to general population.

Public Health 157 - Radiation Protection Criteria for Hospitals. Methods of design, shielding, equipping, and operation of isotope laboratories, X-ray, and other ionizing radiation facilities.

Public Health 238 - Radiation Dosimetry. Radiant energy absorption in liquids, gases and solids; absorption in biological systems.

Public Health 238A - Radiation Dosimetry Laboratory. Laboratory exercises involving principles discussed in 238.

A typical program of study for the M.S. or M.P.H. candidate with a special interest in radiological health is as follows:

Pub.H. 100A,B,C - Elements of Public Health
Pub.H. 102 - Environmental Health
Pub.H. 104 - Epidemiology I
Pub.H. 106 - Public Health Administration
Pub.H. 125 - Introduction to Public Health Education
Pub.H. 143 - Measurement and Application of Ionizing Radiation
Pub.H. 145 - Low-Level Radioactivity and Radiation Measurements
Pub.H. 147 - Environmental Radioactivity
Pub.H. 170A - Administration of Public Health Nursing
Pub.H. 180 - Introduction to Biometry
Pub.H. 210 - Seminar: Public Health
Pub.H. 212 - Seminar: Environmental Health
Pub.H. 230 - Field Practice in Environmental Health
Pub.H. 238 - Radiation Dosimetry
Pub.H. 238A - Radiation Dosimetry Laboratory
Pub.H. 116 - Administration of Environmental Health Programs
Pub.H. 155 - Introduction to the Air Pollution Problem
Pub.H. 156 - Air Pollution Controls and Surveys
Pub.H. 157 - Radiation Protection Criteria for Hospitals
Pub.H. 241 - Epidemiology of Noncommunicable Diseases
An.Ch. 111 - Physiochemical Methods of Analysis
B.Phy. 170-1-2 - Radiation
Ch.En. 161-2-3 - Nuclear Reactor Design
Me.Ag. 127 - Radioisotope Measurements
Phsl. 110 - Physics for Biologists
Phys. 120 - Experimental Atomic, Nuclear Physics

The laboratories of the Division of Environmental Health are equipped with the usual radioactivity and radiation measuring instruments, as well as a number of instruments particularly useful to the student in radiological health. These instruments include a low background anticoincidence counter, a liquid scintillation spectrometer, and a multi-channel pulse height analyzer.

Other University facilities include:

1. A 10,000 Curie gamma irradiation facility and a natural uranium

Sigma pile, Department of Chemical Engineering;

2. A tandem Van de Graaff generator, John H. Williams Laboratory of Nuclear Physics, School of Physics;
3. Teletherapy units, Department of Radiology (a linear accelerator is planned); and
4. A variety of x-radiation machines.

In addition to facilities at the University, there is a nuclear power station, the Elk River Reactor, located less than fifty miles from the campus. This reactor is a facility of the Rural Cooperative Power Association. Northern States Power Company plans to construct two additional power reactors about an equal distance north and south of Minneapolis. Minnesota Mining and Manufacturing Company has a radioisotope production and research facility in the area.

Ground Water Development Course

In 1959 at the request of the ICA, now AID, of the Department of State, the Division of Environmental Health established a special summer course to provide instruction in the development of ground water supplies. This course is designed to meet the needs of engineers from countries where water, and particularly surface water, is at a premium with the result that the country, for its economic and health development, must turn to an increasing degree to ground water sources. Some of these countries represent areas that are seriously economically underdeveloped, in part because of water shortages, which not only impede economic development but cause the public to resort to supplies that constitute serious public health hazards. The thought in back of these courses, and of the ICA in requesting their establishment, has been that the development of water supplies satisfactory both in terms of quantity and quality is essential to the economic well-being and growth of these countries.

In response to this request, the School has developed a 10-week summer course designed particularly for the needs of engineers and geologists from the underprivileged countries but suitable alike for any engineer concerned with this problem. The first six weeks of the course are spent in formal class work on the Minneapolis campus where the students obtain instruction with respect to geological formations, hydrology, well hydraulics and construction, pumping equipment, ground water exploration, and well maintenance. Throughout this period the students live and eat as a group in one of the dormitories.

Following the completion of this segment of the course, the group moves to field experience at Cloquet, Minnesota, where the University Forest Research Center of about five square miles offers a variety of potential water bearing terrains. The students live in cabins and eat in a common mess hall. During this period of the course the students are put in overalls and "helmets" and

are given experience, demonstrations and lectures with respect to the practical aspects of obtaining ground water. Well drilling equipment is brought into the camp under the direction of a driller who has had a tremendous amount of international experience. Here the student participates not only in the operation and maintenance of the equipment but in programs to determine the potential yield of wells and quality of water obtained. The field work throughout the day (sometimes extending throughout the night on 72-hour pumping tests) is supplemented by classroom lectures, conferences and small discussion groups.

In staffing this ground water course the School of Public Health not only provides its own staff but has been able to draw on the resources of other parts of the University including the Institute of Technology. In addition to the assistance from other University departments, the School has enjoyed the full cooperation and assistance of internationally experienced staff of the U.O.P.-Johnson Division of the Universal Oil Products Company. Selected staff of this company have worked hand in hand with the staff of the School not only with respect to the theoretical portions of the course but also throughout the four-week field experience. The School has also enjoyed the assistance of the leading manufacturers of well drilling and pumping equipment.

In addition to the summer course which has been run at the University each year since 1959 except 1963, the School, under its contract with AID, has operated four overseas courses. Two of these were at Bogota, Colombia, in collaboration with the National University of Colombia. The latter two (in 1967 and 1968) were conducted in Ankara, Turkey, in collaboration with the State Hydraulic Works and the Middle East Technical University. In all four cases the School sent complete staff into these countries to cover not only the theoretical but also the field work, again drawing upon the resources

of the Johnson Division and other companies. In each case five to seven persons have been sent out to these courses for various periods of time.

The purpose back of these overseas courses has been to try to help a local institution in the development of comparable courses that can be conducted in the future for local engineers or those from neighboring countries. It is obvious that the School, through its summer program, cannot meet the complete needs of all the developing countries. If, however, a teaching nucleus can be established in certain areas, one can look forward to the further local development of training centers which will meet the needs of engineers who for one reason or other, including language problems, cannot come to Minnesota. Staff of the local institutions have been brought to Minnesota for one or two summers to help prepare them to assume responsibility for such courses. In each of the overseas courses the School has assumed full responsibility for the operation of the first of the courses, during which time it has worked also with local staff preparing them for this type of program. In the second of the two years the local staff has taken more responsibility under supervision of staff of the School. The National University of Colombia already without further Minnesota assistance has been able to complete six courses through its own resources. Further overseas courses staffed by the School of Public Health are being planned for other countries.

Since the inception of this program, 226 engineers from 58 countries have been enrolled at Minnesota. The attached list shows the total enrollment by countries. Engineers from these foreign countries have been selected by their respective ministries on the basis of competence and the positions which they will occupy on their return. These students are supported by AID funds allotted to the country or through the World Health Organization which has provided traineeships, particularly to students from countries where AID

programs are not in effect. There has also been a smattering of other students including a number of engineers from the United States Army assigned to the program by the Department of Defense. Throughout the years that the program has been in operation, the School has been impressed with the general high quality of the students who have been sent to it. The School continues to maintain contact with the majority of these who, in most instances, are assigned to programs definitely related to their Minnesota experience. There has not been as close a follow-up with the students who were enrolled in the courses at Bogota and Ankara where, during these two programs, 45 students were enrolled at Bogota and 43 at Ankara.

A side issue of this program has been the development of a manual on ground water development, a manual that is being written as a part of the contract with AID and which will be used by that Agency in fostering ground water programs in various countries where AID programs are underway. It is anticipated that this manual will be completed and available in time for the 1969 summer course and later for international distribution.

Training and Research Centers

References have been made to use of courses offered elsewhere in the University. The Environmental Health faculty continues to be involved in the affairs of several "Centers" which have been established to encourage and facilitate such interdepartmental training. The University's Water Resources Research Center is one example. Currently, three Environmental Health students are being supported by funds from the Center and are participating in such interdepartmental programs. The newly established Space Science Center will provide a physical resource for teaching and research. We anticipate increasing involvement with a recently constituted Center for Urban and Regional Affairs.

Likewise, the School of Public Health has provided the "home" for an Environmental Health Research and Training Center which is increasingly active in bringing together interested faculty and students from many parts of the University.

Programs in Epidemiology

The teaching programs in epidemiology are directed toward five major objectives: instruction in epidemiology for MPH candidates in the School of Public Health; instruction in epidemiology for students in the Medical School; research training in epidemiology, leading to the degrees of M.S. and Ph.D. in the Graduate School; provision of field research experience to medical students during their free-time and elective periods; and consultation in epidemiologic research to other divisions of the School of Public Health and departments of the other Health Sciences schools (Dentistry, Medicine, Nursing, Pharmacy).

M.P.H. Program

The Division of Epidemiology provides didactic and laboratory instruction in epidemiology for M.P.H. candidates in the School of Public Health as well as an epidemiologic component of the core course (PH 100A) required of all graduate students in the school, except a few in the strictly mathematical programs in Biometry. Basic principles constitute the basic course, PH 104 (class size ranges from 80 to 110 students). Advanced courses in infectious and non-infectious disease epidemiology and health survey methods as well as seminars are offered and constitute the elements of a field of concentration (Class sizes range from 20 to 40 students). The following formal courses in epidemiology are available:

PH 104. EPIDEMIOLOGY I. Basic epidemiologic principles applicable to infectious and noninfectious disease; host-agent-environment complex; factors underlying spread of infectious disease; laboratory applications of statistical and epidemiologic methods.

PH 105. EPIDEMIOLOGY II. Extension of epidemiologic principles to detailed study of selected infectious diseases.

PH 129. EPIDEMIOLOGIC SURVEY METHODS. Practical aspects of survey design, analysis, and interpretation.

PH 213. SEMINAR: EPIDEMIOLOGY. Discussion of selected current epidemiologic problems.

PH 241. EPIDEMIOLOGY OF NONCOMMUNICALBE DISEASES. Application of basic epidemiologic principles to noncommunicable diseases and to trauma; selected disease examples.

Medical Student Instruction

Instruction in epidemiology constitutes a portion of the course in Preventive Medicine for medical students. The Division of Epidemiology is but one of several units in the School of Public Health (serving as the Department of Preventive Medicine for the Medical School) participating in this instruction (Class size is 160).

Research Training in Epidemiology

The Division directs a program of intensive training in epidemiology leading to M.S. and Ph.D. degrees. This program is one of the major efforts of the Division. Its continuing emphasis is based on the critical shortages of individuals adequately trained to continue epidemiologic investigations of existing major health problems and to serve as academicians in this discipline, coupled with the increasing demands for such individuals from health agencies and teaching institutions.

The Ph.D. program, constituted under the Medical Group Committee of the Graduate School, is offered to qualified graduates in medicine, dentistry and veterinary medicine. Other students with adequate background in biological or physical sciences or with demonstrated competence in investigative work may be admitted. The period of training ranges from 3-5 years depending on the candidate's prior academic experience. Such candidates are provided didactic and laboratory experience in epidemiology, participate initially in the Division's on-going research activities, design and execute

major original studies for their thesis research and gain teaching experience through assisting with the laboratory of the basic course (PH 104). The Graduate School requirement for the minor may be fulfilled in one of a large number of related fields: e.g. pathology, sociology, microbiology, etc. etc.

The expansion of this program, grant for which was recently approved, encompasses a multi-track approach constituting a basic epidemiology program core with a diversity of tracks available to the trainee. The tracks are defined compositely in terms of both functional goal and area of interest. Functional goals are primarily control program design, administration and evaluation, health services design and evaluation, or teaching and research. The areas of interest include the infectious diseases, trauma, toxicologic and industrial hazards, maternal and child health problems, the epidemiologic approach to health services and control program administration and evaluation. The selection of track in great part determines the length of the course of study, some tracks being completed in 2 or at most 3 years and lead to the M.S. degree; others, from 3 to 5 years and lead to the Ph.D. In planning space for the future, provision is made for 16 advanced graduate students to be enrolled annually.

Field Research for Medical Students

Through its on-going and expanding research program, the Division is able to provide field research experience in epidemiology for medical students during free-time or elective periods of 3 months each on a fellowship basis or on a part-time research assistantship basis throughout the year. Intensive orientation to the research project of election is provided. The numbers of students in any quarter of the year have ranged from 8 to 22.

Consultation in Epidemiology

The demand for consultation in this area from such diverse areas

as public health nursing, internal medicine, neurology, environmental health, public administration, pediatrics, veterinary medicine and dentistry has been growing steadily. Future service in this area will be commensurate with the size of staff. This is a particularly useful function of the Division for it provides the "two-way" street necessary for the multidisciplinary approach to epidemiologic research and the clinical and population materials necessary for such research.

Graduate Summer Sessions in Epidemiology

The Division of Epidemiology has directed a summer program in epidemiology in 1967 and 1968 as the initial years of a seven-year funded project. The primary purpose of the graduate summer sessions, which are staffed by nationally known epidemiologic academicians (See attached list of faculty scheduled for 1969 program), is to promote and expand research and teaching capabilities of the staff and faculties of other medical institutions and facilities. Highest priority is given to teachers in preventive medicine and epidemiology in medical schools. Close behind are teachers in other departments of medical schools, post-doctoral fellows, graduate students and residents in preventive medicine and other departments. Consideration is also given to teachers, fellows and graduate students in public health, dentistry and veterinary medicine and to qualified persons in health departments and agencies.

The program provides nine distinct courses which have been offered in each of the two past sessions and are planned for future sessions. The student usually selects not more than three of these in any one year. University credit is available for these. The program for 1969 provides the following courses:

FUNDAMENTALS OF BIOSTATISTICS, Colin White, M.B.

This course will include discussions of probability and probability

methods as well as the elementary principles of statistical inference, including X^2, based upon random sampling distributions. Appropriate examples will be utilized. The course will combine lectures and laboratory exercises as the modus operandi.

FUNDAMENTALS OF EPIDEMIOLOGY, Warren Winkelstein, Jr., M.D., Maureen Henderson, M.D., S. Leonard Syme, Ph.D. and Michel A. Ibrahim, M.D.

Basic concepts and methods of epidemiology will be presented through a series of lecture-discussions and small seminars. Seminars are devoted to discussion of exercises dealing with specific diseases; to analysis and interpretation of data derived from vital statistics and morbidity surveys; and to the development and design of an actual epidemiological study.

EPIDEMIOLOGY OF CANCER, Abraham Lilienfeld, M.D. and Leonard M. Schuman, M.D.

The course will be concerned with the epidemiologic aspects of selected cancer sites, including leukemia, cancer of cervix, breast, and stomach. Emphasis will be placed on existing gaps in our knowledge of the epidemiology of these diseases and the types of additional studies needed. Instruction will be by lectures, seminar-type discussions and presentations of reports by participants.

EPIDEMIOLOGY OF CARDIOVASCULAR DISEASES, Peter B. Peacock, M.D. and Lewis Kuller, M.D.

This lecture and discussion course will deal with modern concepts of the epidemiology of arteriosclerotic disease (cardiac, cerebral and peripheral), hypertension, rheumatic heart disease and other forms of cardiovascular disease. The multivariate setting of the

etiologies concerned will be given particular attention.

TOPICS IN INFECTIOUS DISEASE EPIDEMIOLOGY, J. Thomas Grayston, M.D., John P. Fox, M.D. and E. Russell Alexander, M.D.
Students will explore selected topics in depth, using diseases and agents of current interest for subject material. Topics will include factors contributing to epidemic occurrence, factors influencing clinical response to infection, the impact on man of zoonotic and arthropod transmitted infections, immunologic response in disease pathogenesis, epidemiologic usefulness of family and institutional studies, development and evaluation of vaccines, disease control by chemoprophylaxis and chemotherapy, and the concept of eradication. All students will participate actively in the seminars on the basis of assigned and optional reading in efforts to define basic principles and identify important unresolved problems.

SELECTED STATISTICAL TOPICS IN EPIDEMIOLOGY, Marcus O. Kjelsberg,Ph.D.
This course will consider statistical topics of special importance to epidemiologic methodology which are not ordinarily included in basic texts in statistics. Specific topics will include rate adjustments, estimation of relative risk, analyses of matched pair studies, concept of force of mortality, estimation of survivorship and simulation of epidemic models. An example of an incidence model will be presented. Instruction will be by lecture and class exercises.

GENETICS AND EPIDEMIOLOGY, Edmund A. Murphy, M.D.
The course will review genetic methods for evaluating families (pattern of inheritance, segregation ratios, mode of ascertainment) and topics in population genetics (consanguinity, mutation

rates, relative fitness, and polymorphism). These principles will be applied to selected rare and common conditions through discussions and reports.

EPIDEMIOLOGY OF MENTAL DISORDERS, Rema Lapouse, M.D.

The applicability and relevance of epidemiologic concepts and methods to the study of mental disorders will be emphasized in this course. Special methodologic problems relating to psychiatric epidemiology will be considered including such issues as: definition of a case, variability of diagnosis, use of incidence and prevalence to measure the amount of mental illness, use of controls, retrospective and prospective studies and evaluation of results or outcome.

Specific mental disorders will be discussed in seminars using exercises which review the relevant literature and pose questions to which the students will be asked to respond.

EPIDEMIOLOGY OF NEUROLOGIC DISEASES, David Poskanzer, M.D.

The neurologic diseases are, for the most part, not etiologically defined but lend themselves to epidemiologic inquiry. The course will consider in lectures and discussion seminars the general approach to uncommon diseases which those of the nervous system represent. In particular, consideration will be given to the epidemiology of multiple sclerosis, Parkinson's disease, cerebrovascular diseases, and malignant disease and congenital deformities of the central nervous system.

In 1967, of 59 applicants 57 were accepted and 44 matriculated. In 1968, of 122 applicants, 104 were accepted and 83 matriculated.

FACULTY OF THE 1969 SUMMER PROGRAM

DR. E. RUSSELL ALEXANDER, Associate Professor of Preventive Medicine, School of Medicine, University of Washington, Seattle, Washington

DR. JOHN P. FOX, Professor of Preventive Medicine, School of Medicine, University of Washington, Seattle, Washington

DR. J. THOMAS GRAYSTON, Professor and Chairman, Department of Preventive Medicine, School of Medicine, University of Washington, Seattle, Washington

DR. MAUREEN HENDERSON, Professor of Preventive Medicine, University of Maryland Medical School, Baltimore, Maryland

DR. MICHEL A. IBRAHIM, Deputy Commissioner, Erie County Health Department and Associate Professor of Preventive Medicine, School of Medicine, State University of New York, Buffalo, New York

DR. MARCUS O. KJELSBERG, Associate Professor, Division of Biometry, School of Public Health, University of Minnesota, Minneapolis, Minnesota

DR. LEWIS KULLER, Associate Professor of Chronic Diseases, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Maryland

DR. REMA LAPOUSE, Professor of Preventive Medicine and Psychiatry, New York Medical College, New York, New York

DR. ABRAHAM M. LILIENFELD, Professor and Chairman, Department of Chronic Diseases, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Maryland

DR. EDMUND A. MURPHY, Associate Professor of Medicine, School of Medicine, Johns Hopkins University, Baltimore, Maryland

DR. PETER B. PEACOCK, Professor of Public Health and Epidemiology, University of Alabama Medical Center, Birmingham, Alabama

DR. DAVID C. POSKANZER, Associate Neurologist, Massachusetts General Hospital and Assistant Professor of Preventive Medicine, School of Medicine, Harvard University, Boston, Massachusetts

DR. LEONARD M. SCHUMAN, Professor and Head, Division of Epidemiology, School of Public Health, University of Minnesota, Minneapolis, Minnesota

DR. S. LEONARD SYME, Professor of Epidemiology, School of Public Health, University of California, Berkeley, California

DR. COLIN WHITE, Professor of Biometry, Yale School of Medicine, New Haven, Connecticut

DR. WARREN WINKELSTEIN, JR., Professor and Head, Division of Epidemiology, School of Public Health, University of California, Berkeley, California

PROGRAM IN HEALTH EDUCATION

The program in health education prepares individuals to plan, carry out, and evaluate those educational efforts that are aimed toward securing understanding, support, and effective use of health services. Graduates of this program are employed by official and voluntary health agencies at the local, state, and national level, schools, hospitals, community centers, variety of agencies dealing with broad social action programs, industry, insurance companies, medical and dental societies, and many other agencies or institutions directly or indirectly concerned with individual, family, and community health.

The program offers two sequences leading to the Master of Public Health degree: one of 15 months duration for qualified candidates with three or more years of health-related experience and one of 21 months duration for persons who have just completed undergraduate work and/or have no prior employment in health or related fields. Students are selected for these programs on the basis of prior experience and their record of academic work in a) basic health sciences, b) education theory and method and c) social sciences.

Students enrolled in either plan of studies are required to take the established core-courses in public health that are required for the MPH degree; a sequence of health education courses; and a variety of electives in recommended relevant fields of study such as anthropology, sociology, social work, education, psychology, and political science.

A feature of the Minnesota program is the concurrent community laboratory experience under professional supervision. This is initiated when the student begins his studies and is developed in such a way as to test classroom theory against realistic community health situations. Some students are assigned to official or voluntary health agencies and from this base work out into the community. Others are placed in settlement houses, community

centers, or with community organizations and from this base work back to all health service resources which can or should serve the area represented. In either approach, emphasis is placed on the importance of involving community representatives and agency staff in planning education efforts geared toward health programs and services that will meet the needs of the consumer.

As a final rounding-off of academic and community course work, students must satisfactorily complete at least ten weeks of supervised field experience during which they carry out and evaluate health education efforts centered on problems identified during the community laboratory. Two such periods of field experience are required of students in the 21-month program. This may be interspersed with such additional academic work as may be indicated by the needs of the individual student.

Upon satisfactory completion of either program of studies, the individual should have a basic armamentarium of health content, social and behavioral science background, and education principles and methods that will enable him to render a direct education service to the community and to act as a consultant resource in health education in health and allied personnel.

Typical study programs are illustrated in the attached schedule. The following courses in health education are available for students in the foregoing programs or as electives for students in other programs in the School of Public Health:

PubH 125. Introduction to Public Health Education. Required of all students in MPH course of studies except health education specialists and hospital administrators.

PubH 125A. Health Education in Hospitals. Required course for hospital administration students only.

PubH 127. Advanced Studies in Health Education.

PubH 128. Comparative Community Health Education.

PubH 181A. Foundations in Public Health Education Practice. Required course for health education specialists only.

PubH 181B. Principles and Methods of Health Education Planning. Required course for health education specialists only.

PubH 181C. Communication Process in Health Education. Required course for health education specialists only.

PubH 181D. Principles and Methods in Public Health Education--Practicum in Program Evaluation. Required course for health education specialists only.

PubH 181E. Principles and Methods in Public Health Education--Organization and Administration in Health Education. Required course for health education specialists only.

PubH 187A-B-C-D-E. Community Health Education Laboratory.

PubH 193. Group Process in Community Health Education.

PubH 194. Health Education Preparation of Health and Allied Personnel.

PubH 198. Health Education and Contemporary Health Care Systems.

REPRESENTATIVE COURSE SCHEDULE, PROGRAM IN HEALTH EDUCATION

For Both One-Year and Two-Year Course of Studies

TERM	PUBLIC HEALTH CORE COURSES	HEALTH EDUCATION COURSES	RELATED COURSES
II Term SS	PubH 100A- Elements of Public Health (3 cr)	PubH 181A-Foundations in PubH Education Practice (3 cr) PubH 187A-Comm. H.Ed. Lab. (3 cr)	
Fall Quarter	PubH 140-Biostatistics (3 cr)	PubH 181B-H.Ed. Planning (3 cr) PubH 187B-Community H.Ed. Laboratory (3 cr) PubH 193-Group Process in H.Ed. (2 cr)	PubH 123-Nutr. Seminar (1 cr) Anth 150-Cultural Change & Development (3 cr)
Winter Quarter	PubH 100B-Elements of Public Health (2 cr) PubH 104-Epidemiology (3 cr) PubH 106-Pub.H. Admin. (3 cr) PubH 170A-Adm. of Pub. Hlth. Nursing (1 cr)	PubH 180-Communication Process in H.Ed. (3 cr) PubH 187C-Community H.Ed. Laboratory (1 cr)	
Spring Quarter	PubH 100C-Elements of Public Health (1 cr) PubH 102A-Environmental Health (2 cr)	PubH 181D-Evaluation in Health Education (3 cr) PubH 187D-Comm. Health Ed. Laboratory (3 cr) PubH 194-H.Ed. Training of Health, Allied Personnel (2 cr)	S.W. 271-Community Organization (3 cr)
I Term, SS		PubH 181E-Org. & Adm. of H.Ed. Services (3 cr) PubH 187E-Comm. H.Ed. Lab. (2 cr) PubH 190-Field Practice (5 cr)	PubH 198-H.Ed. of Contemporary Health Care Systems (2 cr)
II Term, SS		PubH 190-Field Practice (5 cr)	Ed.CI-105-Audio Visual Aids in Education (3 cr) or PubH 107-MCH (3 cr) or Jour 121-Mass Media (3 cr)

REPRESENTATIVE COURSE SCHEDULE, PROGRAM IN HEALTH EDUCATION

(Outline below indicates continuation into second year for students in 2-year course of studies)

TERM	PUBLIC HEALTH ELECTIVES	HEALTH EDUCATION COURSES	RELATED COURSES
Fall Quarter	PubH 107-Maternal & Child Health (3 cr) PubH 200-Research in in H.Ed. (3 cr) PubH 123-Human Nutrition (3 cr) (optional)	PubH 128-Comparative Comm. H.Ed. (3 cr) PubH 123-Community H.Ed. Laboratory (3 cr)	Electives: Soc. 144 or Soc. 145 or Spch. 161 or Spch. 216
Winter Quarter	PubH 134-Human Genetics (3 cr)	PubH 128-Comp. Comm. Health Ed. (3 cr) PubH 123- Comm. H.Ed. Laboratory (3 cr)	Soc. 162 or Soc. 171 or Anth. 165 or Jour. 112
Spring Quarter	PubH 122-Adm. Problems (3 cr) or PubH 141-Soc. Econ. Aspects of Medical Care (3 cr)	PubH 123-Comm. H.Ed. Laboratory (5 cr)	Soc. 152- Sociol. Med. Institutions (3 cr)

PROGRAM FOR HEALTH OFFICERS

As in all Schools of Public Health, the program for the training of physicians as health officers has been one of the basic purposes of this School even though this program has been numerically one of the smallest. The University's concept of such a program was clearly enunciated as early as 1911 when the Bulletin of the Medical School announced that the School "expects to offer courses during the coming year which will cover one year of time and lead to the bestowal of a certificate in public health." This concept was not fully implemented until 1936, though an occasional physician had been accepted for graduate study as early as 1924.

The present program, with many changes since its formal inception, is designed to train physicians to fill the many vacant positions as local or state health officers or as directors of various types of programs within public health agencies. The program of study, which leads to the Master of Public Health degree, covers 10½ months though under special circumstances a student may still be accepted for a 9-month (one academic year) program. The course of study is designed to supplement the technical knowledge that the student has acquired while in Medical School and to complement this with a broad understanding of the various components of a comprehensive community health program and its administration. In keeping with the School's philosophy of training a public health team, the student is placed in classes with students of other professional backgrounds such as nursing or environmental health, for whose public health programs he will have ultimate administrative responsibility. It is the School's conviction that, by sharing in classes with students of diverse professional backgrounds, the prospective health

officer will gain a better understanding of the work and potential contributions of such persons and of the role their several disciplines play in the overall community program.

To this end the health officers' program is built around the usual core followed by all MPH candidates supplemented by electives best suited to his medical background and to the administrative responsibilities he will later assume. Included in the former are supplemental courses in epidemiology, maternal and child health, medical economics, dental health, genetics, tuberculosis and mental health. Courses of special value to the administrator include additional work in public health administration and electives in public administration offered by the Department of Public Administration of the College of Liberal Arts and shared with students outside of the field of public health.

While the program is ostensibly planned for physicians and so stated in the School's Bulletin, an occasional non-medical person has been accepted if he has had a suitable amount of administrative experience in public health and his admission has been requested by the health department by which he is currently employed and which proposes to continue to employ him upon completion of his training. The School makes no formal announcement of the acceptability of such non-medical personnel as it believes that a printed announcement would be interpreted as an invitation to persons lacking suitable experience and for whom employment after graduation cannot be assured, as the number of agencies seeking or legally capable of employing non-medical health officers is too small to warrant a formal training program. Over the past decade the School has accepted several non-medical students on formal request by a local, state or federal agency, all of which

students have returned to and are currently employed by their respective agencies and as a result of the training are hopefully better qualified for their respective administrative responsibilities. Such students pursue the usual core for all MPH candidates, supplemented by public health courses for which they are qualified, and round out their program with electives in public administration, political science or other social sciences.

Listed below are courses utilized most commonly in formulating the program of study for medical or "non-medical" health officers:

PubH. 100A,B,C	Elements of Public Health
PubH. 104-105	Epidemiology I and II
PubH. 106-122	Public Health Administration and Public Health Problems
PubH. 107	Maternal and Child Health
PubH. 114	Environmental Health Programs
PubH. 120A	Biomedical Computing
PubH. 125	Introduction to Public Health Education
PubH. 129	Epidemiologic Survey Methods
PubH. 133	Mental Health
PubH. 134	Human Genetics and Public Health
PubH. 136	Handicapped Children
PubH. 137	Dental Health
PubH. 140	Vital Statistics I
PubH. 140A	Vital Statistics II
PubH. 141	Social and Economic Aspects of Medical Care
PubH. 143	Measurement and Application of Ionizing Radiation
PubH. 155	Introduction to Air Pollution Problems

PubH. 170	Administration of Public Health Nursing
PubH. 188	Comparative Medicine and Public Health
PubH. 191	Applied Human Nutrition
PubH. 195	Public Health Aspects of Cardiovascular Disease
PubH. 200	Research
PubH. 210	Seminar: Public Health
PubH. 214	Health of School Age Child
PubH. 215	Maternal and Child Health Problems
PubH. 241	Epidemiology of Noncommunicable Diseases
PubH. 261-262	Alternative Patterns for Meeting Health Care Needs
PubH. 269	Political Aspects of Health Services
Anth. 165	Culture and Personality
PA 210	Foundations of Public Administration
PA 224	Social Welfare Administration
PA 247	Urban Development
PA 265	Intergovernmental Administration Relations
PA 280	Local Administration
Pol 130-131	Administrative Process
Soc 106	Planning
Soc 152	Sociology of Medicine and Medical Institutions

PROGRAM IN HOSPITAL ADMINISTRATION*

Master's Degree. Since its inception in 1946, the objective of the program leading to the degree of Master of Hospital Administration (MHA) has been to prepare men and women to achieve, after requisite years of practical experience in responsible supervisory and managerial positions, the chief executive status of administrator or director of a hospital or other health care organization. The program has also aimed to improve the capabilities of future health care planners as well as hospital administrators for effective participation in community-wide programs for health care. Working towards these objectives the Program has graduated twenty-one classes totalling over six hundred students who, with few exceptions, are actively engaged in administration of hospitals or health care programs.

The course of study is entirely at the graduate level and covers a twenty-one month period. Heretofore it has consisted of a full academic year of class work, followed by an administrative residency of one calendar year under the preceptorship of a carefully selected faculty-appointed clinical preceptor in an approved hospital in the United States or Canada. Effective with the class which entered in September 1968, the program is being slightly changed whereby the student will continue in formal class work through the first term (5 weeks) of the summer session before beginning his preceptorship, which is accordingly reduced to 11 months. This change is in accordance with the trend in similar programs in other universities but is far short of the plan pursued by some whereby the residency is replaced completely by a second academic year of classes.

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* Effective with the 1969-70 academic year, the School proposes to change the name of this program to Hospital and Health Care Administration.

The program of study, which heretofore has been quite inflexible, provides for a mixture of courses in hospital and health care administration and in public health. So far as is possible, these latter courses are taken along with students in other programs in the School, thus providing for better understanding of various public health problems and an opportunity to work collaboratively with persons of other professional backgrounds in planning for solution of typical community problems. The student in hospital administration is thus given a broader understanding of public health and its several programs than would be the case if the course of study were developed in a school of business administration, as in some universities. The emphasis on an understanding of the broad field of public health is well illustrated by the fact that for several years the American Surgical Trades Association has offered an annual award for the hospital administration student who achieves the highest grades in the Public Health courses.

In view of the almost unlimited need for personnel in the administration and management of programs for the delivery of health care, the nature and character of the Program is being changed to provide new and alternative paths to career preparation.

1) Recognizing the need for preparation of personnel in comprehensive health planning, the School plans to admit in September 1969 a small group (six to eight students) for an alternative course of study providing two academic years with a nine-week practicum in a planning agency during the intervening summer.
2) Recognizing also the need for the training of executives in third-party payment organizations, it is planned that a program will be initiated, in cooperation with prepayment agencies, to

provide an alternative course of study and supervised practical experience in third-party agencies.

3) Recognizing the pressing and special needs for improved management and administration of mental health services, the Program anticipates the development of an alternative academic course for the training of administrators of mental care facilities and managers and executives of voluntary and governmental mental health organizations.

The addition of these alternative programs will be facilitated by elective courses developed within the Program in Hospital Administration and the School of Public Health. Extensive use will also be made of existing and new courses offered in other parts of the University such as the departments of business administration, economics, political science, psychology, public administration, sociology and the School of Social Work. At the same time the School anticipates that students from other parts of the University, who already utilize some of the Program's courses as electives, will find its new courses in health care of increasing value.

Without decreasing the emphasis on the preparation of administrators and chief executive officers for hospitals, enlargement of the present program and development of the various alternative courses of study will lead to an expanded student body and faculty. In recent years the number of students admitted to the Hospital Administration program has averaged between 30 and 35, less than half of whom have been from the State of Minnesota. It is immediately planned that the entering class size will be increased to 40 students and, dependent upon additional space and staff, to increase it to 50 by 1973. The attached table showing the number of inquiries, valid

applications, acceptances and final enrollment shows clearly that this projected expansion is dependent upon the School's resources for space and staff rather than upon number of applicants. The number of applicants has been increasing constantly with no evidence of slackening. During the period July 1968 through February 1969, the School has received 740 inquiries as compared to approximately 600 during the corresponding period a year ago.

The graduates of the program, who now number over 600, are today occupying positions of responsibility in 45 of the 50 states and in 9 foreign countries, (Brazil, Canada, Chile, Colombia, Hong Kong, Iran, Mexico, Nepal and the Philippines), as well as in the military forces. Especially significant is the fact that graduates of Minnesota direct the program in six of the 23 universities in the United States and Canada offering graduate study in hospital administration and serve on the academic staff of three other university programs. Other graduates occupy key positions on the staff of various associations (American Hospital Association, American University Program in Hospital Administration) and prepayment agencies (Blue Cross) and health care planning councils.

A typical program of study leading to the degree of Master of Hospital Administration consists of the following:

PubH. 100A,B,C.	Elements of Public Health
PubH. 106.	Public Health Administration
PubH. 107A.	Maternal and Child Health
PubH. 108.	Introduction to Biostatistics and Statistical Decision.
PubH. 109.	Institutional Environmental Health
PubH. 125A.	Health Education in Hospitals

PubH. 141.	Social and Economic Aspects of Medical Care
PubH. 160.	Principles of Administration in Hospitals
PubH. 161.	History and Development of Hospitals
PubH. 162 163 164.	Principles of Organization and Management of Hospitals
PubH. 166.	Hospital Clerkship
PubH. 168.	Orientation to Medical Sciences
PubH. 170A.	Administration of Public Health Nursing
PubH. 210.	Seminar: Public Health
Spch. 106A.	Public Speaking, Conference Leadership
Soc. 152.	Sociology of Medicine and Medical Institutions

Courses specifically developed in the field of hospital and health care administration include the following:

PubH. 160. Principles of Administration in Hospitals. Lectures, seminars, and field trips in hospital administrative principles; top management and board of trustees, policy formation, human relations.

PubH. 161. History and Development of Hospitals. Functions; ownership and control; promoting and building new hospitals; integrated service; national associations and foundations.

PubH. 162, 163. Principles of Organization and Management of Hospitals. Departmental structures and functions; organizational principles and practice.

PubH. 164. Principles of Organization and Management of Hospitals. Personnel department; legal liability; fiscal management, hospital insurance, research in administration.

PubH. 166. Hospital Clerkship. Assignment to local hospital for survey and solution of special problem.

PubH. 167. Management Problems in Hospital Administration. Assignment and solution of specific managerial problems.

PubH. 168. Orientation to Medical Sciences. Medical terminology, applied anatomy, and physiology.

PubH. 261, 262. Alternative Patterns for Meeting Health Care Needs. Future role of hospitals and related health services in light of patient needs and community services.

PubH. 264. Seminar: Medical Care Patterns Abroad.

PubH. 265. Seminar: Research Studies on Health Services.

PubH. 266. Hospital Administration Topics. Independent study under tutorial guidance on selected problems, current issues.

PubH. 269. Political Aspects of Health Services. Analysis of interrelationships between government, politics, and health services; political and social bases of health legislation and community decision making in provision and modifications of health services.

PubH. 273. Contemporary Problems of Hospital and Related Health Services. Current concepts, problems, principles, and future developments in hospital and related health services.

PubH. 274. Readings in Theory and Principles of Hospital Administration.

Doctoral Degree. In addition to the Master's degree program, the School offers through the Graduate School a program of study leading to the Doctor of Philosophy (Ph.D.) degree with a major in Hospital and Health Care Administration. This program, which is one of two originally offered in the United States, is intended to prepare teachers and researchers in the health care field. The program began in 1960 with the financial support of the Kellogg Foundation, which for several years provided traineeships. Of the 13 students admitted to this program 3 will have received their degrees by the end of the present academic year, 3 discontinued their studies and the 7 remaining are in varying stages of completion of their doctoral theses.

Since its inception, the program has placed its emphasis on the hospital in its relationship to the community. Research studies have been directed

toward its role as a part of the total program of health care rather than toward the study of internal management problems. Candidates are expected to demonstrate proficiency in: Organization and Administration of Health Care Services; Social, Political, and Economic Aspects of Health Care; and Research Methodology in Health and Health Care. In addition to the work in the major field, students are required to pursue a supporting field of study in related social sciences such as business administration, economics, sociology, industrial relations, public administration, or political science.

Office of Continuing Hospital Education. In 1964, the Hospital Research and Educational Trust of the American Hospital Association received a 1.3 million dollar grant from the W. K. Kellogg Foundation to study and expand opportunities for continuing education in the hospital field for all health care personnel. A significant element of the grant called for the establishment of centers of continuing education in universities that had graduate programs in hospital administration. The University of Minnesota was selected as one of five centers designated in 1964; the official name given to the center was THE OFFICE OF CONTINUING HOSPITAL EDUCATION (OCHE). The states and province included in the Minnesota region are: Iowa, Manitoba, Minnesota, Montana, North Dakota, South Dakota and Wisconsin.

The philosophy of education which underlies the program is one of "collaborative decentralization," that is, establishing institutions and resources where health care personnel can participate in continuing education programs while actively employed. The School believes that the interests of the health care community can thus be served more efficiently and effectively than if educational endeavors are centralized on the University campus. The OCHE's role as a facilitator of educational programs thus has

a three-fold purpose: (a) to stimulate development and operation of programs for continuing education for health care personnel where such programs do not exist, (b) to strengthen already existing programs; and (c) to coordinate efforts by various professional groups and health care organizations in continuing education programming.

The major program endeavors of the OCHE since 1964 have included the following:

1. A year-long survey of all health care institutions in this region to determine educational needs for program planning priorities. This was completed in 1965.
2. A supervisor training program, based in community colleges in the OCHE region, to teach the principles of supervision with hospital applications. So far instructional programs have been established in five colleges in the Minnesota OCHE region, viz Bismarck Junior College at Bismarck, North Dakota, Dakota Wesleyan University at Mitchell, South Dakota, Marshalltown Junior College at Marshalltown, Iowa, United College at Winnipeg, Manitoba and Willmar Junior College at Willmar, Minnesota. The College of St. Martin at Rapid City, South Dakota was later added to the program. Each of these programs in community colleges has had the cooperation and support of local and State hospital associations, which helped to provide a continuing program with yearly presentation. As of this date, approximately 400 health care employees in supervisory positions have completed the course for credit at these community colleges. Plans are to expand to five more community college sites in 1969.

3. Development of a three-year independent study program for health care facility administrators who do not have graduate degrees in hospital administration. The first course will deal with the internal operations of a health care facility with emphasis on management; the second course will focus on the professional relationships within the health care institution and within the community; and the third course will focus on the external forces affecting the health care delivery system. Course I will begin in July 1969, Course II in July 1970 and Course III in July 1971 at which time all three courses will be offered concurrently. Each course will be twelve months in length with two weeks of sessions at the University, eleven months of home study (which will include preceptor-student dialogues, attendance at decentralized seminars, as well as correspondence study) and a final week of review and examinations at the University. Long-range plans for the program include applying for course certification and credit equivalents which might be used to apply towards a Bachelor's degree.
4. Annual institutes on hospital-wide education and training have been held periodically by the OCHE staff in this region. A major conference on this topic will be held in September 1969 in co-operation with the Hospital Research and Educational Trust.

During the coming year the OCHE has plans for developing an independent study program for nursing home administrators which will help them to acquire licensure under the medicare requirements. There is also a need in this region for a conference between administrators, trustees and representatives

of medical staff specifically designed for the smaller hospital. Plans for a conference on this topic are in the early stages. Development of continuing education programs for medical record librarians are also contemplated.

Presently the OCHE is staffed by two-part-time faculty members and one full-time member; plans for expansion include the addition of a full-time staff member having a background in adult education. This position is being funded by the Upper Midwest Hospital Association, but the individual will serve as a faculty member of the OCHE staff. With the addition of this position in July 1969, there will be a major effort to be of direct service to the hospital associations and member hospitals in educational programming and development. The OCHE will also be in a position to function as a clearinghouse of information for hospital continuing education directors and directors of education for the hospital associations.

MATERNAL AND CHILD HEALTH

The Division of Maternal and Child Health, like other elements of the School of Public Health, serves the dual role of developing a group of graduate students with a special interest in this area and of imparting subject matter knowledge to students whose primary interest is in other components of the health program. The former group consists essentially of physicians and dentists, many of whom come from developing countries where infant mortality still constitutes one of the major public health problems. With increasing frequency nurses, social workers, physiotherapists and health administrators seek opportunity to concentrate in this subject area. The Division is heavily involved in community activities including on-going medical clinics and demonstration programs in economically depressed areas. Close working relationship including joint academic appointment are maintained with the departments of Pediatrics and Obstetrics of the Medical School and the Department of Human Ecology of the School of Dentistry. Special attention is given to a program for public health orientation and indoctrination of interns and residents in pediatrics.

Two major programs of study are offered by this Division: Maternal and Child Health and Public Health Nutrition. (The program in Public Health Nutrition is described separately elsewhere). In both programs, students spend about one-third of their time studying basic public health subjects required of all Master of Public Health degree candidates. The rest of their course work is divided between specialized courses in Maternal and Child Health or Nutrition and relevant electives offered in this School or by departments elsewhere throughout the University.

Individualized study and a variety of guided practical experiences are possible in maternity clinics and other community health services established for families or children. A typical program of study with emphasis on Maternal and Child Health is shown in the attached tabulation. Special courses in this area have been developed as follows:

MATERNAL AND CHILD HEALTH COURSES

Public Health 107. Maternal and Child Health. Health needs and services for mothers and children in public health programs.

" 107A. Maternal and Child Health Program. Community programs for major maternal and child health problems. (Hospital Administration students only.)

" 134. Human Genetics and Public Health. Evaluation of current studies in human genetics and applications to community health.

" 136. Handicapped Children. Prevention and rehabilitation of handicapping conditions affecting children; community activities related to emotional, physical, and intellectual handicaps.

" 200. Research. Opportunities will be offered by the School of Public Health and by various cooperating organizations for qualified students to pursue research work.

" 214. Health of the School Age Child. Review of major health problems among children of school age; methods of providing and evaluating school health services.

" 215. Maternal and Child Health Problems. Problems in administration of health programs for infants, preschool and school age children, handicapped children, and women of child-bearing age.

Public Health 123. Topics in Public Health. Selected readings in public health with discussion based on these readings. A number of special MCH topics are pursued under this course number (Clinical and Community Correlations, Population Problems, MCH and Comprehensive Health Planning, Clinical Work and Field Observations, and tailored independent reading).

A POSSIBLE COURSE PLAN FOR STUDENTS WITH SPECIAL INTEREST IN MATERNAL AND CHILD HEALTH

	REQUIRED	Cr.	MCH	Cr.	RELATED	Cr.
SSII	PubH 100 A Elements of PubH	3	PubH 107	3	(Wide variety of courses available: credit or audit)	
Interim					PubH 123 (Community Orientation)	6
					PubH 182 (Preventive Dentistry)	3
Fall Qt.	PubH 140 (Biostat)	3	PubH 215 (Prob.)	3	PubH 191 (Nutr)	3
	PubH 125 (Hlth.Ed.)	2			Public Administration 280	3
	PubH 114 (Env.Hlth.)	3			PubH 210 (Sem)	0
Winter Quarter	PubH 106 (Adm)	3	PubH 134 (PubH Genetics)	3	Anthro 165	3
	PubH 104 (Epid)	3	PubH 214 (School Health)	3	PubH 183 (Dent. Seminar)	1-3
	PubH 100B (Elem)	2			PubH 210 (Sem)	0
	PubH 170 (PHN)	2				
Spring Quarter	PubH 100C (Elem)	1	PubH 136 (Handicapped)	3	PubH 122 (Adm.Prob)	3
					PubH 141 (SocEcon)	3
			PubH 123 (Population Prob.)	3	PubH 133 (Mental Health)	3
			PubH 123 (Community MCH)	2	PubH 137 (Dental Health)	1
			PubH 200 (Research)	2	PubH 184 (Dental Seminar)	1-3
					PubH 210 (Sem)	0
SSI			Field Work - Arranged			

PROGRAM IN PHYSIOLOGICAL HYGIENE

The program of the Laboratory of Physiological Hygiene is addressed to three areas of functions: 1) Research, which receives the greatest emphasis (in keeping with the fact that research grants provide the largest source of financial support); 2) Teaching at under-graduate, graduate, and post-doctoral levels, and 3) Service, especially at national and international levels. In all of these functions, the program reflects the basic philosophy of the Laboratory, namely, that it should cultivate the field of knowledge of the relationship between the mode of life (especially diet and habits of physical activity, smoking, etc.) and health, or the converse of disease and death.

In keeping with this philosophy as to its mission the Laboratory has an interdisciplinary staff with background in internal medicine, biochemistry, nutrition, physiology, and statistics. At various times in past years it has had anthropologists and psychologists as members of its staff.

1. Research - In contrast to other parts of the School of Public Health, the Laboratory, because of the nature of its financing, devotes its major attention to its extensive research program. From its inception in the late 1930's when its major concern was with the physiology of exercise, the interests of the Laboratory have broadened to focus on the many aspects of the epidemiology of cardiovascular disease, with special attention to nutrition. This interest in nutrition found early expression in its development of the K ration for the Army and its war-time studies of starvation in a volunteer group of conscientious objectors, studies which yielded information of value in the rehabilitation of malnourished civil populations.

A major emphasis of the current research program is on prospective studies to discover and evaluate relationships in men age 40 and older between

the incidence of circulatory disease, especially coronary heart disease, and pre-disease characteristics. A group of business and professional men, originally 300 in number, is now in the twenty-second year of followup with annual detailed examinations. Almost 3,000 U.S. railroad employees sampled from nineteen major companies in the northwest quadrant of the country have had entry and five-year follow-up examinations and will be followed further with help of the Railroad Retirement Board. Over 9,000 men in 15 cohorts in six other countries are being studied with identical methods and criteria by international teams coordinated by the staff of the Laboratory. These programs, supported by specific research grants, have involved extensive studies in such countries as Italy, England, Spain, Union of South Africa, Yugoslavia, Israel, Finland and Japan.

This broad follow-up program and the selection of the geographical areas under study have been devised with two guiding principles in mind. First, relationships between disease incidence and particular pre-disease characteristics that may be discovered to hold in differing populations are "universals" and should have the highest significance for understanding etiology and attempting prevention. Second, the evaluation of the significance for disease of any characteristics is greatly facilitated by studying a wide range in that characteristic. In order to assess the role of diet and of physical activity, for example, it is important to find and study population samples that cover a wide range of these variables. Pursuit of these principles has yielded samples of men that not only differ greatly in diet, physical activity, etc., but also differ by over 10 to 1 in incidence of coronary heart disease and over 3 to 1 in the all-causes death rate. Some of the apparently responsible risk factors have been revealed; others are being sought.

The current program of nutrition research continues a series of controlled dietary experiments on man, started 20 years ago, which have been fruitful in revealing relationships between dietary constituents and the blood lipids. The Laboratory took a leading part in the National Diet-Heart Study reported in 1968. Much effort has recently gone into developing protocol and paper organization for the logical sequel of this study aimed at mounting a major experimental trial directed toward primary prevention of coronary heart disease. It is hoped that this program, or at least something similar, will find support and will continue as a major part of the Laboratory program for the next seven to ten years.

Throughout its studies, the Laboratory has utilized the electrocardiogram as a major guide in providing objective classifications of people for epidemiological purposes. Besides much theoretical work, the Laboratory has taken the lead in providing quantitative standards in electro-cardiography and has produced the "Minnesota code"--a classification now widely used internationally. A recent two-day seminar on electrocardiography attracted over a hundred participants from all parts of the country as well as some from overseas.

2. Teaching - For many years, the Laboratory has provided under-graduate instruction in elementary physiology and in human nutrition. Courses developed for these purposes are as follows:

Public Health 91. Physiological Hygiene. Basic physiological principles and facts. For physical education majors.

Public Health 92. Physiological Hygiene. Effects of exercise, nutrition, environment, and age on performance and health. For physical education majors.

Public Health 95. Human Nutrition. Principles of nutrition, application to individual and family eating patterns, discussion of nutritional aspects of selected community problems or programs. Required of all students in dental hygiene.

Of more interest to the staff of the Laboratory is its graduate instruction in human nutrition, epidemiology of cardio-vascular disease, and exercise physiology. Courses developed for these purposes are as follows:

Public Health 191. Applied Human Nutrition. Food composition and standards of nutrient requirements; methods in dietary and nutritional status surveys; applications of nutrition to public health programs related to specific diseases and population groups.

Public Health 192. Physiology of Exercise. Muscular efficiency, training, deconditioning, effects of exercise on metabolism and physiological systems.

Public Health 195. Public Health Aspects of Cardiovascular Disease. Etiology, incidence; problems of control and relationship to mode of life.

Public Health 202. Seminar: Physiological Hygiene. Nutrition, tests and measurements of human physical fitness; gerontology; adaptation in health and disease; body composition; circulatory dynamics and related topics.

Public Health 220. Readings in Problems of Physiological Hygiene.

Public Health 290. Research in Physiological Hygiene and Related Areas.

The professional staff, besides their appointments in the Laboratory, enjoy Graduate School status in the Departments of Biochemistry, Medicine and Physiology according to their respective backgrounds. They also serve as members of the interdisciplinary faculty of the Graduate School's program in nutrition. In its many international studies, the Laboratory has provided local scientists the opportunity of participating in its studies, providing an almost tutorial type of research training on a personal

non-academic basis. Investigators from other countries as well as from the U. S. have also spent variable periods of time in the Laboratory at the University, sometimes on a formal student basis, but at other times, as visiting collaborators in research projects. In this phase of its program, the Laboratory has offered instruction in various aspects of electro-cardiography and lipid metabolism. It has also organized international seminars on the epidemiology of cardio-vascular disease, sponsored by the International Society of Cardiology, first given in 1968 in Yugoslavia and to be held in September, 1969, in Italy.

3. Service - The service program of the Laboratory includes central classification of electrocardiograms for the National Coronary Drug Study, serum collesterol analyses for the National Cooperative Diabetes-Study, ECG and serum collesterol analyses in cooperative studies in Finland, Greece, Italy, Japan, the Netherlands and Yugoslavia. Senior staff members serve as consultants to the Public Health Service, the World Health Organization, and the Food and Agriculture Organization of the United States.

PROGRAM IN PUBLIC HEALTH NURSING

The public health nursing program, which began at Minnesota in 1919 as a short course to provide basic instruction for nurses employed by health departments and visiting nursing services, gradually expanded into a full program of undergraduate study leading to a Bachelor's degree for those who spent two or more years of academic study after completing their basic nursing training. This undergraduate program reached its height shortly after World War II but gradually was phased out as collegiate schools of nursing incorporated public health instruction as a part of their basic baccalaureate programs. During the last couple of years, however, it has become increasingly apparent that, in spite of the growth of the collegiate schools, there is a significant number of nurses employed by public health agencies who have not had suitable public health training and are in need of supplemental instruction. As a consequence, the School, in the summer of 1968, again received a group of staff-level nurses, all of whom are actively employed by nursing agencies, and provided for them a ten-week program of combined class work and practical supervised experience. It is anticipated that this program will continue in future years.

The graduate program in public health nursing started originally as a nine-month sequence, gradually expanding to 12-months, later 15, and currently covering two full academic years of study. The basic purpose of this program, which leads to a Master's degree, is to train supervisors, administrators and teachers. The core courses in Public Health required of all Master of Public Health students are, as far as practicable, taken with students of other professional backgrounds, and are distributed between the two years of study.

The emphasis in the first year of the program is on the normal physical, social and emotional development of the individual from birth to adulthood. The content from Sociology, Psychology, Communication and other related fields is given by instructors from these several departments. The nursing faculty conducts a weekly seminar which links the theory of the formal classes to the practical application. Throughout this year the students, working with public health nursing agencies of the Twin City area, have practical experience in carrying selected home cases.

The core courses in nursing in the second year emphasize chronic and mental illness, rehabilitation, and maternal and child health. The families visited have individual members who have been patients and have been referred to the School by local agencies and hospitals including the out-patient department of the University Hospitals and the Minneapolis Combined Nursing Service. During this time the students have opportunity for experience in the Pilot City Health Center located in a disadvantaged area of North Minneapolis. All of the nurses have experience with the psychiatric team at Hennepin County Mental Health Clinic, Metropolitan Health Center or at St. Mary's Hospital mental health unit. This is supplemented by weekly seminar conferences with a psychiatrist and public health nursing faculty members at which time there is discussion of mental health problems encountered on home visits.

During the second year of the program the student elects a sequence in the functional area of her choice-teaching, supervision and administration, school nursing, or long-term nursing. Those who choose supervision as their functional area have an opportunity for supervisory experience with the Combined Nursing Service of the Minneapolis Health Department, the Community

Nursing Service of St. Paul and the Suburban Nursing Service of Hennepin County. Those who choose teaching as a functional area participate actively in one of the baccalaureate programs of the several schools of nursing in the Metropolitan area. A special grant from the Public Health Service provides support for the program for the training of teachers of public health nursing. Students in this program are enrolled in the Graduate School as candidates for the Master of Science degree. Their study sequence embraces a combination of courses in public health, social science and education. Students who find their functional area in school nursing work in a selected school system in the Metropolitan area. Nurses especially interested in long-term care are provided with extra instruction and special experience through the University Rehabilitation Center, experience which includes home follow-up of patients who have been in the Center and who, without adequate nursing follow-up, run the risk of reverting to the state of disability that existed prior to their rehabilitation program in the hospital or clinic. Students in this latter program are under the immediate direction of Miss Eleanor Anderson, Associate Professor in Public Health Nursing, who, prior to her appointment in the School, was the consultant in rehabilitation for the National League of Nursing.

The program of study followed by the students is normally drawn from the following courses:

(Credits shown in parentheses; **indicates required courses; ***indicates additional course required in MPH program)

PubH 100A,B,C** --Elements of Public Health (6)

PubH 102A*** --Environmental Health (2)

PubH 104,** 105 --Epidemiology I and II (6)

PubH 106,*** 122 --Public Health Administration (6)

PubH 107 --Maternal and Child Health (3)

PubH 125*** --Public Health Education (2)

PubH 134 --Human Genetics and Public Health (3)

PubH 136 --Handicapped Children (ar)

PubH 137 --Dental Health (1)

PubH 140** --Vital Statistics I (3)

PubH 171** --Research Methodology in Nursing (3)

PubH 173** --Culture and Public Health I (3)

PubH 175A,B** --Foundations of Public Health Nursing (ar)

PubH 176** --Clinical Seminar: Public Health-Mental Health Nursing (4)

PubH 177** --Group Process (2)

PubH 179A,B --Long-Term Patient Care and Rehabilitation (ar)

PubH 200** --Research (ar)

PubH 210 --Seminar: Public Health

PubH 214 --Health of the School-Age Child (2)

PubH 215 --Maternal and Child Health Problems (3)

PubH 221 --Seminar: Long-Term Patient Care and Rehabilitation (ar)

PubH 222 --Seminar: School Nursing and Related Field Practice (ar)

PubH 224 --Seminar: Public Health Nursing Within the Curriculum (ar)

PubH 225 --Practicum in Teaching Public Health Nursing (ar)

PubH 226A** --Clinical Seminar: Public Health-Mental Health Nursing (ar)

PubH 226B,C** --Clinical Seminar: Concepts of Behavior in Illness (ar)

PubH 241 --Epidemiology of Noncommunicable Diseases (3)

PubH 280 --Orientation to Supervision and Administration in Public Health Nursing (3)

PubH 281 --Problems in Supervision and Administration in Public Health Nursing (3)

PubH 282 --Practicum in Supervision or Administration in Public Health Nursing (ar)

PubH 283 --Seminar: Consultation (2)

PubH 285 --Culture and Public Health II (3)

CD 132 --Adolescent Development (3)

CD 140 --Behavior Problems (3)

EdCI 217 --Seminar: School Health Education Program (ar)

EdCI 250 --Higher Education in the United States (3)

EdCI 251 --Curriculum Trends in American Colleges (3)

EdCI 252 --Effective College Training (3)

EPsy 110 --Educational Measurement in the Classroom (3)

EPsy 125 --Group Dynamics (3)

EPsy 182 --Education of Exceptional Children (3)

Hlth 117B --Advanced Instruction in School Health for Secondary Schools (3)

NuEd 175 --Educational Administration in Nursing (3)

Soc 120 --Social Psychology (3)

Soc 126 --Family Development (4)

Soc 140 --Social Organization (3)

Soc 141 --The Family (3)

Soc 152 --Sociology of Medicine and Medical Institutions (3)

Spch 169** --Speech, Language in Human Behavior (3)

SW 260 --Administration in Social Work (2)

PROGRAM FOR PUBLIC HEALTH NUTRITIONISTS

PURPOSE

The science of nutrition, when applied in prevention and therapy, contributes to the positive health and welfare of all members of society. A need exists for specially trained nutrition personnel to assist in the conduct of expanding health and welfare programs. It is essential that public health nutritionists acquire the ability to: (a) apply advanced nutrition knowledge in a wide variety of circumstances, (b) work with multidisciplinary groups in comprehensive health services, and (c) train other workers in basic nutrition principles.

OBJECTIVES

Specific objectives for public health nutrition students are:

1) To acquire competence in the science of nutrition;
2) To enlarge their scope of knowledge in multiple areas, including the core of public health, behavioral sciences, education, and related health and welfare programs;
3) To apply knowledge in programs of a health agency or in community nutrition activities.

Additional objectives of nutrition services in the School of Public Health are:

1) To provide students preparing for other health professions with an opportunity to learn basic nutrition principles and identify how these can be applied to individual, family, school and community situations;

2) To help hospital dietetic interns identify community agency functions, the role of agency nutritionists and dietary consultants, and ways in which hospital dietitians and agency nutritionists can cooperate.

PLAN OF INSTRUCTION

Applicants for the program leading to the degree of Master of Public Health must have completed a Bachelor's degree program with a major in nutrition, dietetics or home economics with appropriate courses in biochemistry, microbiology, nutrition, dietetics, education, psychology, behavioral sciences, foods, and food service management.

The course of study covers a minimum of 12 months. Credits are distributed approximately one-third in public health core courses, one-third in nutrition, and one-third in related courses in the areas of social welfare, community organization, behavioral sciences and education. Instruction in this program is dependent upon a close working relationship with the School's Division of Physiological Hygiene and the Division of Nutrition in the School of Home Economics. The program of study is designed to prepare students to occupy nutrition positions in a wide variety of agencies and programs, including the broad fields of health, education, welfare and industry. Typical positions for nutritionists for which training is provided are as follows:

1) Federal, state and local health departments;

2) Welfare agencies at the Federal, state and local level;

3) Departments of education, particularly in the training of diet or nutrition aides;

4) Specially funded projects such as, maternity and infant care and children and youth projects;

5) Poverty programs;

6) Councils, foundations and other industry supported educational services dealing with nutrition;

7) International work, especially in the current programs of the World Health Organization and the Food and Agriculture Organization in developing areas of the world.

8) College teaching, medical center teaching positions, particularly those involved with dietetic internship programs and nursing programs.

SAMPLE PROGRAM - PUBLIC HEALTH NUTRITIONISTS

	Public Health Core Courses	Cr.	Nutrition Courses	Cr.	Related Courses	Cr.
SSII	100 A (Elem. Pub. Hlth.)	3	PubH 196 (Seminar)	1	PubH 107 (MCH)	3
Interim			PubH 189 (Field Course)	4		
Fall Qt.	140(Statistics)	3	H. E. 170 (Human Nutr.)	3	Selected course in Anth., Soc., Pub.Ad., Educ., S. W., Etc.	3-6
	125(Hlth. Educ.)	2	PubH 196 (Sem.)	1		
			PubH 123(Prob.)	1		
Winter Quarter	104(Epid.)	3	H. E. 171(Human Nutrition)	3		
	106 (Adm.)	3				
	100 B(Elem.P.H.)	2	PubH 196 (Seminar)	2		
	170 (Nursing)	2				
Spring Quarter	102 A (Env.H.)	2	PubH 196(Sem.)	2	Selected courses in Anth., Soc., Pub.Ad., Educ., S.W., Etc.	6-8
	100 C(Elem.PH)	1	PubH 191(Nutr.)	3		
SSI			PubH 189 (Field Course)	6		
SUBTOTALS		21		**26		12-17
TOTALS						*59-64

* A Minimum of 45 credits required for graduation.

** Includes 10 credits of Field Course (PubH 189).

TYPES OF POSITIONS CURRENTLY OCCUPIED BY PERSONS WHO HAVE COMPLETED THE COURSE FOR PUBLIC HEALTH NUTRITIONISTS

1) Faculty, School of Public Health
2) Chief nutritionist, state health department
3) Nutrition consultant, state health department
4) District nutritionist, state health department
5) Chief of hospital therapeutics and instructor in dietetics
6) University research project in mental retardation
7) Food industry (Professional Education Unit)
8) National Nutritional Status Survey of Pre-School Children
9) City health department
10) Neighborhood Center

PROGRAM FOR PUBLIC HEALTH VETERINARIANS

The program for public health veterinarians stems from the realization that animals and animal products constitute an important part of man's environment, serving both for his benefit and as potential hazards to his welfare. They provide an important part of his food supply yet are often a source or vehicle for his infection. The veterinarian, whose basic training prepares him to deal with the health of animals, is therefore an important member of any comprehensive public health team. His potential contribution to the maintenance of human health has not been adequately recognized by public health agencies.

The University of Minnesota is uniquely prepared for a program to train veterinarians for public health work as it is the only university that has both a school of public health and a college of veterinary medicine on what is essentially the same campus. Although the Veterinary Colleges is located on the St. Paul campus 3-miles distant from the Minneapolis campus, the two campuses are connected by free express bus service every 5-10 minutes during the day.

The objective of the program for public health veterinarians, operated in collaboration with the College of Veterinary Medicine, is to train a selected group of qualified veterinarians to work in health programs. These students have, within limits, an adequate prior knowledge of strictly veterinary subject matter, but are usually seriously lacking in knowledge of general public health and therefore not prepared to work as part of a comprehensive team, whether it be in the realm of infectious disease control or environmental health. The objective of the veterinary public health program is to superimpose a knowledge of other aspects of public health onto their preexisting veterinary knowledge

so that they will understand their place in the program, their potential contribution to the work of others and the assistance that other members of the public health team can give to them. Through their incorporation into the student body of the School they help other students to understand the importance of veterinary concepts and their significance for human health.

Applicants are accepted into this program on the basis of a veterinary degree (with suitable honor point average) from an accredited veterinary college, or, in the case of foreign applicants, on the basis of approval and support by an appropriate international agency or foreign government. The program of study leading to the MPH degree begins with the second term of the summer session and continues through the following spring quarter, providing almost 11 months of study. The program includes 1) the usual basic core (PH 100A,B and C, and courses in environmental health, epidemiology, health education, public health administration, public health nursing and statistics) supplemented by 2) electives from the School of Public Health, 3) electives from the College of Veterinary Medicine and 4) electives from other parts of the University, such as the the Department of Microbiology of the Medical School or the Department of Food Science and Industry of the Institute of Agriculture. Among the electives available from Veterinary Medicine and other departments are the following:

Dairy Industry 110. Sanitation Microbiology.

Dairy Industry 113. Technical Control of Dairy Products.

Dairy Industry 151. Advanced Dairy Bacteriology.

Entomology 118. Experimental Ecology.

Microbiology 116. Immunology.

Microbiology 124. Virology and Animal Cell Culture.

Political Science 131. Public Administration.

Veterinary Microbiology 128. Problems in Veterinary Bacteriology and Public Health

Veterinary Microbiology 205. Advanced Veterinary Bacteriology.

Veterinary Microbiology 221. Advanced Veterinary Public Health.

Veterinary Pathology and Parasitology 202. Seminar: Pathology.

Veterinary Pathology and Parasitology 240. Advanced Veterinary Parasitology.

Veterinary Surgery and Radiology 219. Fundamentals of Nuclear Medicine.

Veterinary Surgery and Radiology 235. Radiation Biology.

Since the inception of this program, more than 100 veterinarians have been registered in the School as degree candidates. While a large proportion of the students have been assigned to the School by employing agencies such as the Air Force, Army, Department of Agriculture educational institutions or health departments, the program has served as a recruiting force, bringing into public health work very capable veterinarians who are now employed by and occupy positions of responsibility in public health agencies. A significant number of the graduates of this program are now teaching in veterinary colleges. Several students, after completion of their MPH degree have transferred to the Graduate School, completed Ph.D. programs in some phase of veterinary medicine and are now in academic or research positions. Of special note has been the large number of foreign students who have been supported by WHO, AID or their own governments, and are now occupying highly responsible

academic or administrative positions in their respective countries. Students have come to the course from the following countries: Argentina, Ceylon, Dominican Republic, Indonesia, Israel, Italy, Jamaica, Japan, Korea, Mexico, Panama, Peru, Philippines, Sudan, Sweden, Thailand, Trinidad and Venezuela.

Title of Course	Principal Student Category	Number of Students	Length of Course-Clock Hours	Participant Hours
Minnesota Institute for Hospital Administrators (Feb. 24-28, 1969)	Hospital Administrators	71	27	27
Supervisory Training Programs:				
Minnesota: Willmar Jr. College (Sept.-Nov., 1968)	Department Heads, First Line Supervisors of health care institutions	20	15	15
South Dakota: St. Martin's Jr. Coll. Rapid City (Oct.-Feb., 1969)	" " "	15	20	20
Manitoba: Univ. of Winnipeg (Sept.-Jan., 1969)	" " "	35	18	18
Fifth Alumni Institute in Hospital Administration (June 4-6, 1969)	Hospital Administrators (Graduates of the Program)	225	18	18
Basic Environmental Microbiology Cape Kennedy, Florida (March) Langley, Virginia (July)	Engineers	56 (+ 5 auditors)	40	2240
Fifth Accident Prevention	NOT GIVEN			
Swimming Pool Operators	Swimming Pool Operators	50	8	400
Environmental Health Factors in Medical Care Facilities (Albany, N.Y.)	Sanitarians and Engineers	30	25	750

Title of Course	Principal Student Category	Number of Students	Length of Course-Clock Hours	Participant Hours
Midwest Interprofessional Seminar on Diseases Common to Animals & Man	Veterinarians Physicians Biologists	85	17	1445

SCHOOL OF PUBLIC HEALTH
University of Minnesota
Research Support
June 4, 1969

Title	Director	Source	Budget Period	Amount	Division Total	School Total
DIVISION: Administration						
General Research Support Grant	Anderson	USPHS	1/1/69-12/31/69	$ 99,493	$ 99,493	
DIVISION: Biometry						
The Biometry Division has placed its research emphasis on statistical participation in a wide variety of research projects throughout the College of Medical Sciences. Many studies of a purely statistical nature have been published by the staff as individuals rather than through grant supported projects.						
Menstrual History Project	Kjelsberg	USHPS	6/29/68-6/28/69	25,461		
Anti-Coag TB Pro & t Studies	McHugh	Other	Pending	8,000	33,461	
DIVISION: Environmental Health						

Currently the Division is involved in a wide range of research interests, providing a more healthful and safer environment. Studies in water resources including aquatic biology, especially as related to physical, chemical, and biological limnology, and water management, including systems analysis, run off, and ground water recharge. Hospital studies relate to solid waste disposal and the microbiological characteristics of the hospital environment, including laminar flow ventilation. Air pollution investigations are oriented to study particulate, gaseous, and meteorological aspects of the urban atmosphere, and relationships to asthma. In radiological health the action of metal chelates and the characteristics of low energy X-ray are being studied. A major effort is directed to basic bacterial sterilization phenomena as related to the NASA Planetary Quarantine program.

It is anticipated that these studies will be continued. However, there is need to expand water studies to include consideration of specific chemical constituents as related to cardiovascular disease, effect of exposure to subtoxic levels of contaminants, effects of water reuse. Studies are indicated to identify and evaluate

Title	Director	Source	Budget Period	Amount	Division Total	School Total

urban-oriented stresses such as noise, traffic, housing and land use, accidents, and degradation of water quality in the distribution system. More effort is needed with respect to the problems of institutional living -- especially those relating to delivery of health services. Finally, the public health aspects of modern food technology (processing, packaging, storage and distribution) require a major research effort.

Relation of Air Pollution to Allergic Diseases	Cowan	USPHS	1/1/68-6/30/69	$ 41,650		
Hospital Maintenance Positions	Bond	USPHS	7/1/68-6/30/69	5,089		
Toxicology and Pharmacology of Chelating Agents	Foreman	USPHS	3/1/68-6/30/69	30,432		
Hospital Solid Waste Disposal	Bond	USPHS	6/1/68-5/31/69	39,415		
Urban Aerosol as Related to Meteorologic Data	Paulus	USPHS	6/1/68-5/31/69	9,355		
Study of Hospital Dishwashing Facilities	Jopke	USPHS	3/1/69-3/20/70	21,900		
Environmental Microbiology as Related to Planetary Quarantine	Bond	NASA	6/1/68-5/31/70	181,000		
Environmental Microbiology as Related to Planetary Quarantine	Bond	NASA	6/1/68-5/31/69	200,000		
Water Resources Research	Olson	OWRR	7/1/68-6/30/69	9,000		
Lake Superior Periphyton	Olson	USDI	7/1/68-6/30/69	40,598		
Water Resources Research - Gibson	Straub	OWRR	7/1/68-6/30/69	12,149		
Model Systems and Overfertilization of Surface Waters	Straub	OWRR	7/1/68-6/30/69	11,365		
					$601,953	

Title	Director	Source	Budget Period	Amount	Division Total	School Total
DIVISION: Epidemiology						

The research interests of the Division of Epidemiology have been and will undoubtedly continue to be promarily directed toward the epidemiologic exploration of environmental factor in disease production. In this regard technical laboratory research as support for epidemiologic field investigation and as approached to verification of hypotheses suggested by such field studies will continue to be promoted. An expansion of epidemiologic effort in the area of social and psychosodial factors in disease as part of the greater milieu of the community will however, be undertaken, particularly as they apply to "Westernization", migration, "urbanization", and other forms of aculturization. Recently completed studies have included investigation of the pathogenesis of Silo-Filler's disease, relationship of central nervous systems neoplasms to toxoplasms infection, background radiation as a factor in childhood leukemia, and genetic factors in the epidemiology of hare lip and cleft palate.

Chronic Disease Training Directors Conference	Schuman	USPHS	4/1/69-3/31/70	$ 820		
Cancer Mortality Study	Schuman	USPHS	12/23/68-12/22/69	45,000		
Third National Cancer Survey	Schuman	USPHS	10/1/68-9/30/69	75,310		
					$121,130	

DIVISION: Program in Hospital Administration

Research interests are directed to developing and evaluating new patterns in organization and financing health care and services in both rural and urban areas and constraining the rising costs of health care. This includes developing improved measures and methods for evaluating health services. In this process, the Program plans to work closely with the new Department of Family Practice and Community Health of the Medical School.

Systems Development Project	Weckwerth	Children's Bureau	7/1/68-6/30/69	314,376		
Austin-Albert Lee Region Study	Dornblaser	Other	Pending	118,330		
					432,706	

DIVISION: Laboratory of Physiological Hygiene

The Laboratory of Physiological Hygiene was organized to furnish a locus for research and teaching in those matters of hygiene and the prevention of disease and death that involve physiological factors in contrast

Title	Director	Source	Budget Period	Amount	Division Total	School Total

to the factors of infection and sanitation so commonly emphasized in the current use of the word hygiene. From its inception in 1937 it has been concerned with the effects on health and disease of the mode of life, especially to diet and physical activity. A major interest for the past twenty years has been coronary heart disease. More broadly the Laboratory is concerned with circulatory and respiratory function in general, and the way these functions change with age and different modes of life. Controlled experiments on man, cross-sectional surveys, and prolonged follow-up studies on contrasting population samples are used as methods of approach to these questions. The staff has been increasingly dedicated to what may be considered the common ground of physiology, epidemiology, and internal medicine.

Circulatory and Metabolic Functions in Aging Man	Keys	USPHS	1/1/69-12/31/69	$ 62,730		
Electrocardiographic and Constitutional Correlation	Simonson	USPHS	9/1/68-8/31/69	15,176		
Epidemiology of Heart Disease	Keys	USPHS	12/1/68-11/30/69	53,167		
Contract on Physical Fitness	Taylor	USPHS	5/1/69-4/30/70	27,786		
Physical Activity and Isochemic Heart Disease	Taylor	USPHS	8/1/68-7/31/69	65,000		
Diet and Blood Lipids in Man	J. Anderson	USPHS	1/1/68-6/30/69	45,582		
Physical Activity and Coronary Risk	Taylor	USPHS	4/1/68-6/30/69	28,075		
Drugs and Coronary Heart Disease	Blackburn	USPHS	1/1/69-12/31/69	35,332		
Contract on Exercise Electrocardiography	Blackburn	USPHS	6/27/68-6/26/69	5,582		
Military Fatigue Project	Keys	USPHS	7/1/68-6/30/69	32,873		
Multifactor CHD Prevention	Keys	USPHS	Pending	447,055		
Epidemiology of Heart Disease	Keys	Other	7/1/68-6/30/69	11,000		
State of California Olive Advisory Board	Keys	Other	7/1/68-6/30/69	6,839	$836,197	

Title	Director	Source	Budget Period	Amount	Division Total	School Total
DIVISION: Maternal and Child Health						

Research in the Division of Maternal and Child Health reflects concern for children with handicapping conditions. The prime objective is to indicate possible avenues to prevention of disabilities and ways of improving services for affected children.

Future research efforts will study possible relationship of dental and intellectual problems of young children to hyperbilirubinemia. Concurrently, school performance of a group of children whose mothers had certain complications of pregnancy will be compared with a like group for whom gestation was recorded as uncomplicated.

Exchange Transfusion Project	Bridge	USPHS	4/1/68-6/30/69	$ 71,000		
					$ 71,000	
TOTAL SCHOOL OF PUBLIC HEALTH:						$2,195,940

Section H - Students

1. Selection of Students

All applications for admission to the School of Public Health are referred to the Director of the division responsible for the program in which the applicant seeks enrollment. The Division Director, after conference with appropriate members of his staff, and notably the prospective advisor, makes his recommendation to the Director of the School, who in turn makes his recommendation to the Dean of Admissions of the University. In arriving at decisions, the divisions of Health Education, Hospital Administration and Public Health Nursing make use of the Miller Analogies Test, graduate level. The Division of Hospital Administration further requires a personal interview with either a member of its faculty or a conveniently located and carefully selected hospital administrator, usually a graduate of the program, and, in its final selection of students, places great emphasis on the report of this interview. Other divisions arrange for such interviews of many but not all applicants, but, in the absence of such interviews, give great weight to evaluation of the applicant by staff of the employing agency who are known to the School.

Students are selected without regard to race, color or creed. Over the past 20 years the School has had each year several non-white students. During the past year it has had 12 such students, variously enrolled in programs in biometry, environmental health, health education, hospital administration, nutrition, public health administration and public health nursing.

Admission to the Graduate School is through action of the Dean of that School acting upon advice of the prospective advisor and Director of the School of Public Health.

2. Enrollment of Students - See attached tables.

Section H-2

UNIVERSITY OF MINNESOTA

SCHOOL OF PUBLIC HEALTH

Full & Part-time Enrollment

Including Special Summer Programs

1959 - 1969

Academic Year

Program	1959 '60	1960 '61	1961 '62	1962 '63	1963 '64	1964 '65	1965 '66	1966 '67	1967 '68	1968 '69
Biometry	34	26	18	38	35	27	35	38	31	38
Dental Public Health	0	1	1	0	2	4	3	2	4	5
Environmental Health	32	25	35	35	64	61	70	93	117	109
Epidemiology	7	7	9	9	9	6	6	4	6	4
Health Education	14	13	8	7	12	14	12	5	13	10
Hospital Administration	58	61	66	74	71	68	74	79	83	74
Physicians (Health Officers)	11	7	4	10	8	17	12	3	7	7
Public Health Nursing	46	39	34	47	53	52	65	66	42	37
Public Health Nutrition	-	-	-	-	-	-	4	11	14	11
Public Health Veterinarians	6	5	7	10	12	10	11	10	5	3
Physical Therapy	-	-	-	-	-	-	2	3	-	1
Laboratory	2	0	0	0	0	0	0	0	0	0
Special Summer Program:										
Graduate Epidemiology	-	-	-	-	-	-	-	-	44	83
Ground Water	43	34	26	25	-	35	25	23	23	27
Hospital Engineering	-	-	-	-	-	38	30	36	28	23
Public Health Nursing	-	-	-	-	-	-	-	-	-	27
Statistics	-	60	102	-	-	-	-	-	-	-
Total School of Public Health	253	278	310	255	266	332	289	383	421	442

GRADUATE STUDENT ENROLLMENT

BY PROFESSIONAL GROUPS

FALL QUARTER

	1948	1958	1968
Biometry	3	19	31
Dentistry	--	--	5
Environmental Health	6	25	70
Epidemiology	--	4	4
Health Education	9	11	10
Hospital Administration	45	54	73
Nutrition	--	--	5
Physicians	11	8	5
Public Health Nurses	19	25	35
Veterinarians	--	6	3
Others	1	--	2
	94	152	243

Graduate Student Enrollment
by States and Countries
Fall Quarter, 1968

States	
Alaska	1
Arizona	2
California	5
Colorado	10
Connecticut	1
Delaware	2
Florida	3
Georgia	1
Hawaii	1
Idaho	1
Illinois	7
Iowa	6
Kansas	3
Kentucky	2
Maryland	5
Massachusetts	1
Michigan	3
Minnesota	94
Mississippi	1
Missouri	2
Montana	2
Nebraska	4
New Jersey	4
New Mexico	2
New York	8
North Carolina	1
North Dakota	3
Ohio	5
Oklahoma	3
Oregon	4
Pennsylvania	3
Rhode Island	1
South Dakota	4
Tennessee	4
Utah	1
Virginia	1
Washington	5
Washington, D.C.	1
West Virginia	2
Wisconsin	8
	217

Foreign Countries	
Canada	3
China	4
Ethiopia	1
Great Britain	1
Guyana	1
Iceland	1
India	1
Jamaica	2
Korea	2
Norway	2
Peru	1
Thailand	2
Venezuela	4
Viet Nam	1
	26

GRADUATE STUDENT ENROLLMENT

BY PROFESSIONAL GROUPS

SUMMER SESSION II

	1948	1958	1968
Biometry	--	--	22
Dentists	--	--	5
Environmental Health	--	27	98
Epidemiology	--	--	--
Health Education	--	10	14
Hospital Administration	--	23	39
Nutritionists	--	--	7
Physicians	--	1	4
Public Health Nurses	--	5	26*
Veterinarians	--	1	3
Other	--	--	1
	--	67	219

Contrary to the practice in some Schools of Public Health, the summer session at Minnesota is just as busy as the regular academic year. Since 1959 the School has operated a special 10-week ground water course for engineers from other nations. A five-week course on hospital engineering is now in its fifth year, as is a federally financed training program in fresh-water quality research. A concentrated three-week program in epidemiology designed for teachers of preventive medicine is in its third year of a five-year federal grant and for each of the past two years has attracted over 90 registrants. Furthermore all of the Master's degree programs except those in hospital administration and public health nursing, both of which are now on a two-academic-year basis, begin with the second term of the summer session. The foregoing table showing second summer session enrollment depicts the degree to which the School is involved in the training program over and above the usual academic year.

*Special ten-week program for nurses employed by health agencies but lacking basic training in public health nursing. Although all students possess Bachelor's degrees, instruction was at undergraduate level.

Graduate Student Enrollment
by States and Countries
Summer Session II, 1968

States		Foreign Countries	
Arizona	1	Australia	1
California	5	Belgium	1
Colorado	7	Bolivia	1
Delaware	1	Britian	1
Florida	2	Canada	4
Georgia	1	China	2
Hawaii	1	Colombia	2
Idaho	2	Dominican Republic	1
Illinois	6	Guam	1
Iowa	3	Iceland	1
Kansas	3	India	4
Kentucky	3	Jamaica	3
Maryland	1	Korea	2
Massachusetts	2	Morocco	1
Michigan	3	Nepal	3
Minnesota	82	Pakistan	2
Missouri	2	Peru	1
Montana	1	Puerto Rico	1
Nebraska	4	Somali Republic	3
New Jersey	2	Sudan	1
New York	6	Thailand	2
North Dakota	2	Trinidad	2
Ohio	4	Turkey	1
Oklahoma	3	Venezuela	3
Oregon	3		44
Pennsylvania	2		
South Dakota	3		
Tennessee	2		
Texas	2		
Virginia	1		
Washington	2		
Washington, D.C.	2		
West Virginia	2		
Wisconsin	9		
	175		

SCHOOL OF PUBLIC HEALTH
Geographic Distribution of Students in Special Summer Programs

Last Known Address	Ground Water		Special Summer Epidemiology		Hospital Engineering	
	Enrol	Not Enrol	Enrol	Not Enrol	Enrol	Not Enrol
North America						
United States						
Alabama						
Alaska			1			
Arizona			1		1	
Arkansas						
California			8		4	1
Colorado			1	1	1	
Connecticut			1			
Delaware						
Florida						
Georgia			2		1	
Hawaii						
Idaho						
Illinois			5	2		
Indiana			1	1		
Iowa			1			
Kansas			1			
Kentucky			3		1	
Louisiana			3	3		
Maine			1			
Maryland			6	1		
Massachusetts	1			2		
Michigan			1		1	
Minnesota	1		5	1	2	1
Mississippi				1		
Missouri			4	2		
Montana						
Nebraska						
Nevada						
New Hampshire						

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Last Known Address	Ground Water		Special Summer Epidemiology		Hospital Engineering	
	Enrol	Not Enrol	Enrol	Not Enrol	Enrol	Not Enrol
New Jersey						
New Mexico			1	1		
New York			6	8		
North Carolina			1	1		
North Dakota						
Ohio			6	3	2	
Oklahoma			1	1	1	
Oregon						
Pennsylvania			6			
Rhode Island						
South Carolina						
South Dakota						
Tennessee			2			
Texas	1		2		1	
Utah			1			
Vermont			1			
Virginia			1		1	
Washington						
West Virginia					1	
Wisconsin				1		
Wyoming						
District of Columbia			3	1	1	
Canal Zone						
Guam						
Puerto Rico				3	1	
Total United States:	3		76	33	19	2
Other North America	1		5	2	4	1
Africa	4	3				
Middle East	1	1				
Southeast Asia						

Last Known Address	Ground Water		Special Summer Epidemiology		Hospital Engineering	
	Enrol	Not Enrol	Enrol	Not Enrol	Enrol	Not Enrol
Orient	9	1				
Far East Asia	1					
Europe	1		2			
Australia/New Zealand	1					
South America	5	2				
Central America	1			1		
Total Foreign:	24	7	7	3	4	1
GRAND TOTAL:	27	7	83	36	23	3

SCHOOL OF PUBLIC HEALTH
Former Students by States and Regions

Last Known Address	Health Officers	Hosp. Admin.	Health Educ.	Public Health Nursing	Bio-metry	Environ-mental Health	Nutri-tion	Veterin-arians	Misc.	Total
North America										
United States										
Alabama		2		1	1	1		1		6
Alaska		1		1		4				6
Arizona		9	2	9		1				21
Arkansas				1		1		1		3
California	8	42	16	39	3	21	1	1		131
Colorado	2	12	2	8	2	6	1	3		36
Connecticut		4	2	2						8
Delaware					1	2				3
Florida		8	1	1		7		2		19
Georgia		1	1	6	1	4		5		18
Hawaii		1	1	3				1		6
Idaho	1	4	1	1		4				11
Illinois	5	29	11	12	1	24		5		87
Indiana		13	2	5		2		2		24
Iowa	2	8	1	10		13		5		39
Kansas	1	7	2	7		2				19
Kentucky	1	5		5		1	1			13
Louisiana	1	1		3		1		1		7
Maine		1								1
Maryland	2	13	3	9	8	14		2		51
Massachusetts		13	3	3	2	4	1		1	27
Michigan	5	13	5	6	2	4		1		36
Minnesota	28	116	25	80	26	101	8	17	1	402
Mississippi	1							1		2
Missouri	3	11	2	2		8	1			27
Montana			1	5		7				13
Nebraska	3	4	5	2		11		1		26
Nevada	1	2				1				4
New Hampshire		1								1
New Jersey	1	6	2	2	1	1				13

Last Known Address	Health Officers	Hosp. Admin.	Health Educ.	Public Health Nursing	Bio-metry	Environ-mental Health	Nutri-tion	Veterin-arians	Misc.	Total
New Mexico		6		3	2	3				14
New York	1	26	2	18	4	20	1	1		73
North Carolina		5	3	7		2				17
North Dakota	1	3	1	2		8				15
Ohio	1	24	2	15	3	24	3	2		74
Oklahoma		4	1			3				8
Oregon	6	8	1			8				23
Pennsylvania		8	6		1	15		1	1	32
Rhode Island		10								10
South Carolina										
South Dakota	2	6				13		1		21
Tennessee	1	5		4		3		1		14
Texas	3	20		11		6		5		45
Utah		7	1		2					10
Vermont		2		1						3
Virginia	3	5	1	2		3		1		15
Washington	6	13	2	6	1	6		1		35
West Virginia		3								3
Wisconsin	10	27	6	11	2	18	2	2	1	79
Wyoming		1		2		1				4
District of Columbia	4	18		8		16		2		48
Canal Zone	1	1								2
Guam		1				1				2
Puerto Rico			4							4
Total United States:	104	530	118	313	63	395	19	65	4	1611
Canada	4	13	4	4		5				30
Mexico	2	4	1					1		8
West Indies	1		5	2				3		11
Central America	2		3			7		1		13
South America	12	8	6	10		8		3		47

Last Known Address	Health Officers	Hosp. Admin.	Health Educ.	Public Health Nursing	Bio-metry	Environ-mental Health	Nutri-tion	Veterin-arians	Misc.	Total
Europe	6	2	5	5	4	4		1		27
Africa			3	3	1	4		1		12
Middle East	11	1	2	2		4		3		23
Southeast Asia	8		1	1				1		11
Far East Asia	33	5	6	12		2		4		62
Orient	13	4	13	5	1	9				45
Australia/New Zealand	1									1
Unknown	1		8							9
Total Foreign:	94	37	57	44	6	43		18		299
GRAND TOTAL:	198	567	175	357	69	438	19	83	4	1910

SCHOOL OF PUBLIC HEALTH
Former Students by States and Regions
Special Summer Programs

Last Known Address	Summer Epidemiology Course	Special Ground Water Course	Summer Hospital Engineering Course	Total
North America				
United States				
Alabama	1		2	3
Alaska			1	1
Arizona			5	5
Arkansas				0
California	5	1	7	13
Colorado	1		6	7
Connecticut			1	1
Delaware				0
Florida	1		1	2
Georgia			1	1
Hawaii		1	1	2
Idaho			1	1
Illinois	2		8	10
Indiana			4	4
Iowa	1		1	2
Kansas	1		1	2
Kentucky			1	1
Louisiana	1			1
Maine				0
Maryland	2		6	8
Massachusetts		3	2	5
Michigan	5		4	9
Minnesota	3	2	16	21
Mississippi	2			2
Missouri			1	1
Montana			3	3
Nebraska			1	1
Nevada				0

Last Known Address	Summer Epidemiology Course	Special Ground Water Course	Summer Hospital Engineering Course	Total
New Hampshire				0
New Jersey			1	1
New Mexico				0
New York	1		6	7
North Carolina	1		1	2
North Dakota				0
Ohio	1		8	9
Oklahoma	1	1	3	5
Oregon				0
Pennsylvania	2			2
Rhode Island				0
South Carolina				0
South Dakota		2		2
Tennessee	1			1
Texas	1			1
Utah				0
Vermont				0
Virginia	1			1
Washington				0
West Virginia	1			1
Wisconsin		1		1
Wyoming				0
District of Columbia				0
Canal Zone				0
Guam				0
Puerto Rico	1			1
U.S. Overseas Employees		26		26
Total United States:	36	37	93	166
Canada	4	6		10
Mexico	1	2		3
West Indies		13		13
Central America		16	1	17
South America		65	1	66

Last Known Address	Summer Epidemiology Course	Special Ground Water Course	Summer Hospital Engineering Course	Total
Europe	2	4		6
Africa		17		17
Middle East		24		24
Southeast Asia		7		7
Far East Asia		17		17
Orient		37		37
Australia/New Zealand		1		1
Unknown				0
Total Foreign:	7	209	2	218
GRAND TOTAL:	43	246	95	384

UNIVERSITY OF MINNESOTA

SCHOOL OF PUBLIC HEALTH

Degrees Awarded

1959 - 1968

Academic Year

Program	1959 '60	1960 '61	1961 '62	1962 '63	1963 '64	1964 '65	1965 '66	1966 '67	1967 '68
Biometry	7	2	5	3	18	4	7	4	17
Dental Public Health	0	0	1	0	2	1	3	2	1
Environmental Health	14	7	14	8	33	31	22	30	26
Epidemiology	6	2	1	2	3	4	2	0	1
Health Education	4	3	4	0	8	4	7	5	5
Hospital Administration	29	31	27	29	33	30	33	36	36
Physicians (Health Officers)	8	7	2	4	4	6	8	4	0
Public Health Nursing	11	19	17	11	40	22	27	32	3**
Public Health Nutrition	-	-	-	-	-	-	2	1	1
Public Health Veterinarian	5	3	2	4	5	5	2	2	2
Physical Therapy	-	-	-	-	-	-	0	1	1
Laboratory	0	0	0	0	0	0	0	0	0
Total School of Public Health	84	74	73	61	146*	107	113	117	93

* Divisions of Environmental Health and Public Health Nursing pressured former students to complete Plan B papers required for award of M.S. or M.P.H. degrees.

** Public Health Nursing program extended to two academic years of study.

Section I - Faculty

Full-time faculty are defined by the School as persons who, aside from occasional community service appointments, devote their full energies to the work of the School and derive their entire University salary from the School. Part-time faculty consist of three categories.

1. Persons on full-time employment with the University but whose salary is paid in part by other portions of the University. These are essentially joint appointments.

2. Persons who devote a portion of their time to the School of Public Health in return for which they are paid a definite remuneration, the balance of their time being given to some activity outside of the University.

3. Staff of community health agencies, including hospitals, who receive no remuneration from the School but whose contribution may range from full responsibility for a University course to an occasional lecture. Such persons are carried as lecturers in the School, the usual academic classifications being reserved for those on a full-time or part-time paid basis.

I-2. Current and Projected Faculty

ACADEMIC STAFF**
1968-69

	Admin. & P.H. Admin.	Bio.	Env. Hlth.	Epid.	Hlth. Educ.	Hosp. Admin.	MCH	Pers. Hlth.	Phys. Hyg.	PHN	Total
Full-time, Sch. of PubH.	2	8	11	1	2	6	4	2	4	9	49
Full-time, Univ. PT, Sch. of PubH.	3	6	8	3	3	2	2	3	--	--	30
Part-time, Paid	2	1	6	--	--	11	--	--	1	--	21
Part-time, Non-paid	9	1	12	1	2	4*	4	--	--	3	36
TOTAL:	16	16	37	5	7	23	10	5	5	12	136

*Plus 40 Clinical Preceptors

**(Exclusive of teaching assistants and of personnel exclusively on research projects and without teaching responsibilities) 1968-69.

Estimates 1973-74

	Admin. & P.H. Admin.	Bio.	Env. Hlth.	Epid.	Hlth. Educ.	Hosp. Admin.	MCH	Pers. Hlth.	Phys. Hyg.	PHN	Total
Full-time, Sch. of PubH.	6	16	15	6	3	10	6	4	8	15	89
Full-time, Univ. PT, Sch. of PubH.	4	10	10	6	3	2	8	2	--	--	45
Part-time, Paid	4	1	6	--	--	15	4	--	2	5	37
Part-time, Non-paid	9	1	12	1	2	4	4	--	--	3	36
TOTAL:	23	28	43	13	8	31	22	6	10	23	207

SCHOOL OF PUBLIC HEALTH
Academic Salary Ranges
June 20, 1969

Rank	Twelve Month Appointments 1968 - 1969 Salary Ranges	1971 - 1972 Salary Ranges	1974 - 1975 Salary Ranges
Professor	$20,000 - 33,000	$23,600 - 38,940	$27,200 - 44,880
Associate Professor	$17,000 - 21,200	$20,060 - 25,016	$23,120 - 28,832
Assistant Professor	$11,500 - 22,000	$13,570 - 25,960	$15,640 - 29,920
Instructor	$ 9,480 - 16,900	$11,186 - 19,942	$12,892 - 22,984
Research Associates	$16,000 - 17,000	$18,880 - 20,060	$21,760 - 23,120
Research Fellow	$ 9,000 - 12,650	$10,620 - 14,927	$12,240 - 17,204
Research Specialist	$ 7,000 - 10,400	$ 8,260 - 12,272	$ 9,520 - 14,144
Research Assistant*	$ 7,056	$ 8,326	$ 9,596
Teaching Associate I*	$ 8,328	$ 9,827	$11,326
Teaching Associate II*	$ 9,240	$10,903	$12,566
Teaching Assistant*	$ 7,392	$ 8,723	$10,053

* The School of Public Health pays the Academic Floor Rates.

Data for 1971-72 estimated at 118% of 1968-69 ranges. Data for 1974-75 based on 138% of 1968-69 ranges.

SCHOOL OF PUBLIC HEALTH
Academic Salary Ranges
June 20, 1969

Rank	Nine Month Appointments 1968-1969 Salary Ranges	1971-1972 Salary Ranges	1974-1975 Salary Ranges
Professor	$17,250 - 21,600	$20,355 - 25,488	$23,460 - 29,376
Associate Professor	$11,800 - 15,550	$13,924 - 18,290	$16,048 - 21,148
Assistant Professor	$10,800	$12,744	$14,688
Instructor	$ 7,110 - 9,000	$ 8,390 - 10,620	$ 9,670 - 12,240
Research Associate	$ 6,975	$ 8,231	$ 9,486
Research Fellow	$ 6,570	$ 7,753	$ 8,935
Research Specialist	$ 4,500	$ 5,310	$ 6,120
Research Assistant*	$ 5,292	$ 6,245	$ 7,197
Teaching Associate I*	$ 6,246	$ 7,370	$ 8,495
Teaching Associate II*	$ 6,930	$ 8,177	$ 9,425
Teaching Assistant*	$ 5,544	$ 6,542	$ 7,540

* The School of Public Health pays the Academic Floor rates.

Data for 1971-72 estimated at 118% of 1968-69 ranges. Data for 1974-75 based on 138% of 1968-69 ranges.

Section I-5 CURRICULA VITAE OF KEY STAFF

Gaylord W. Anderson, Mayo Professor and Director. Born in Minneapolis, December 31, 1901. A.B. Dartmouth, 1922. Studied at Sorbonne, Paris, 1922-23, University of Zurich, 1923. Assistant in Chemistry, Harvard 1923-24. M.D., Harvard, 1928; Dr. Public Health, 1942. Intern, Albany (N.Y.) Hospital, 1928-29; Epidemiologist, Massachusetts Department of Public Health 1929-30; Assistant Director, Division of Communicable Diseases, 1930-31; Director and Deputy Commissioner of Public Health 1931-37. Teaching Assistant in Public Health Administration, Harvard School of Public Health, 1931-37; Executive Secretary, Massachusetts Legislative Commission on Public Health Laws and Practices, 1935-37; Head, Department of Preventive Medicine and Public Health, Medical School, University of Minnesota, 1937-44; Director, School of Public Health, 1944-46; Mayo Professor and Director, School of Public Health, 1946-present. Major to Colonel, Medical Corps, U.S. Army, 1942-46, assigned to the Office of the Surgeon General, War Department; 1943-45 Director, Division of Medical Intelligence, decorated Legion of Merit; special consultant to Department of State in missions to Brazil, Argentina, Chile, Peru, 1948, Colombia, Ecuador, 1949, Chile 1950; Korea, 1954, for WHO to Egypt 1953, India, Iran, Egypt, 1958. Recipient Harrington Award, Minneapolis Junior Chamber of Commerce 1959; Sedgwick Memorial Award, American Public Health Association 1963; decorated by government of Peru with Order of Hipolito Unanue, rank of Commander 1967; Honorary Fellow, Royal Society of Health; member American Public Health Association (president 1952), American Epidemiological Society (president 1951), American College of Preventive Medicine, Massachusetts Medical Society, American Society for History of Medicine.

Representative publications:

Communicable Disease Control (with M. G. Arnstein and M. R. Lester) 4th Edition, 1962.

Global Epidemiology (with J. S. Simmons, T. F. Whayne and H. H. Horack) Vol. I, 1944; Vol. II, 1951, Vol. III, 1954.

Chapter on Epidemiology in Bacterial and Mycotic Infections of Man (edited by Dubos and Hirsch) 1965.

Poliomyelitis Occurring after Antigen Injections. Pediatrics 7:741-59 (June) 1951.

Public Health - A Mandate from the People. American Journal of Public Health 42:1367-73 (Nov.) 1952. Presidential Address to American Public Health Association.

CURRICULUM VITAE

BOND, Richard G., Professor and Director, Division of Environmental Health. Born Dec. 9, 1916. B.S.(Civil Engineering) Univ.of New Hampshire, 38; M.S.(Sanitary Engr.) Univ. of Iowa, 40; M.P.H.Univ. of Minnesota, 48. Teaching Asst., New Hampshire, 38-39; Research Asst. Iowa, 39-40; Public Health Engineer, State Dept.of Health, Iowa, 40-47; Asst. Prof. School of Civil Engr., Cornell, 47-49; Asst.Prof. School of Public Health, Minnesota, 49-53; Assoc.Prof., 53-58; Prof., 58--; Director, Division of Environmental Health, 62--; Public Health Engr., Univ. Health Service, 49-62. Consultantships: National Institutes of Health, Division of Research Services, 58--; National Cancer Institute, 62--; Environmental Health Sciences Institute, 65--; Bureau of Solid Wastes Mgt., 68--; Office of the Surgeon General, U.S.Army, 62--; University of Leeds England, Health Service, 64. Chairman, American Institute of Biological Sciences - NASA - Planetary Quarantine Advisory Committee, 65--; Hon. Fellow, Royal Society of Health; Hon. Member, British Public Health Inspectors Assoc.; Ruth E. Boynton Award, Am. College Health Assoc., 68; ASCE Committee on San. Engr. Manpower, 69--; Office of Internation Programs Council, U.of Minn.

Selected Publications:

1. Microbiological Contamination of Hospital Air - Part I Quantitative Studies. (with V.W.Greene, D. Vesley, G.S. Michaelsen) Applied Microbiology 10: 6, 561-566, Nov. 1962.
2. Training Qualified Engineers for a Hospital Career. (with G.S.Michaelsen, H. M. Bosch) Hospitals, Vol.37, pp 94-96, May 1963.
3. Prevention of Onset of Infections and Parasitism by Environmental Control. Cleveland Health Goals Project, The Welfare Federation, Cleveland, March 1964.
4. Spacecraft Contamination Resulting from Human Contact. NASA Conference on Spacecraft Sterilization Technology,SP-108, pp 275-283, 1966.
5. Environmental Peculiarities of a Hospital Setting. Chapter 5. Control of Infectious Diseases in General Hospitals. APHA, Lib.of Congress #67-18365 1967.

BRIDGE, ALLYN G. (Gustave), School of Public Health, University of Minnesota, Minneapolis, Minnesota 55455. Springfield, Massachusetts, April 22, 1923; M.D. Yale, 1948; M.P.H. Minnesota, 1961. Private Practice of Pediatrics, 1953-59; Pediatric Consultant, Minnesota Department of Health, 1959-61; Director, Maternal and Child Health, Minn. Dept. of Health, 1961-63; Associate Professor, School of Public Health and Lecturer Pediatrics, 1961 --; Consultant, Indian Health Service; Am. Board Pediatrics, 1954, Am. Acad. of Pediatrics, Am. Pub. Health Association.

PUBLICATIONS:

"Public Health Aspects of the Prematurely Born Infant", Minnesota Medicine 43: 116-122 (February) 1960.

"Neonatal Deaths in Hennepin County:--A Five-Year Report", (Written for the Hennepin County Perinatal Mortality Study Committee), The Journal Lancet, 82: 159 (April) 1962.

"Methemoglobinemia in a Hospital Nursery", Journal of the American Medical Association 185: 760-763 (September 7) 1963.

"Fetal and Neonatal Deaths", 1962 Report of the Hennepin County Perinatal Mortality Study Committee, Minnesota Medicine, 47: 867 (July) 1964.

"A General Look at our Pre-school Population", Proceedings Bi-Regional Conference on Changing Dimensions of Health Services for Pre-School Children, Minneapolis, 1965.

Norman Arthur Craig, Associate Professor and Director, Health Education. Born in South Bend, Ind., November 10, 1915. B.A., Adams State College, Alamosa, Colorado, 1939; MPH, University of California at Berkeley, 1949. Health Educator, Butte County Health Department, California, 1949-52; Health Education Advisor, PAHO/WHO, Honduras, 1952-43; Zone (Central America, Panama, British Honduras) Health Education Advisor, PAHO/WHO, Guatemala, 1953-55; Zone (Mexico, Caribbean Area) Health Education Advisor, PAHO/WHO, Mexico, 1955-59; Associate Professor, Escuela e Instituto de Salubridad y Enfermedades Tropicales, Mexico, 1956-59; Regional Advisor in Health Education, PAHO/WHO, Wash.,D.C., 1959-63; Assistant Professor, Health Education, School of Public Health, University of Minnesota, 1963-67; Associate Professor and Director, Program in Health Education, 1967-present.

Representative Publications:

"Role of Health Education Programs in Trepanematosis Eradication" Working paper prepared for WHO/PAHO Seminar on Trepanematosis Eradication, Port-au-Prince, Haiti, October 12-17, 1956.

"Role of Health Education in Malaria Eradication," Working Paper presented at the meeting of the WHO Expert Committee on Malaria, Lisbon, Portugal, September 1958.

"Educational Approaches in the Malaria Eradication Program," with Dorothy B. Nyswander & Mary Jo Kraft, Special Publication of the Office of Public Health, International Cooperation Association, Washington 25, D.C., October 26, 1959.

"Health Education Preparation of Health Personnel," Swasta Hind (India), 10:137-401 (May) 1966.

Co-author and Associate Editor, Health Education in the USSR, Public Health Papers 19, World Health Organization, Geneva, Switzerland, 1963.

Bright M. Dornblaser, Professor and Director, Hospital Administration. b. Minneapolis, Dec. 22, 1925. B.B.A., Minnesota 1949, M.H.A. 1952. Secretary, Philadelphia Board of Health 1952-54; Instructor, School of Public Health, Minnesota 1954-55; Assistant Director, Danbury (Conn.) Hospital 1956-60; Director, Franklin County Public Hospital, Greenfield, Mass. 1960-67; Professor and Director, Hospital Administration, School of Public Health, Minnesota 1967-present. Research interests: geriatric rehabilitation, rural health care.

Selected Publications:

The Hospital Administrator, His Emerging Role. Hospital Administration, Fall 1966, Vol. 11 No. 4, pp. 6-16.

Dornblaser, Bright M. and Edward J. Rising, Ph.D. Hospital-Based Extended Care - Part One, Conducting an ADL Rehabilitation Program, Hospitals, Journal of the American Hospital Association (May 16, 1969) Vol. 42 No. 10, pp. 68-82.

Dornblaser, Bright M. and Eugene P. Piedmont, Ph.D. Hospital-Based Extended Care - Part Two, A Social Model of Extended Care, Hospitals, Journal of the American Hospital Association (June 1, 1969) Vol. 42 No. 11, pp. 103-156.

The Social Responsibilities of the General Hospital. Hospital Administration, Spring 1969, Vol. 14 No. 2, pp. 6-17.

Contributed, section on hospitals to 1969 edition of the Encyclopedia Americana.

Ancel Keys, Professor and Director, Laboratory of Physiological Hygiene. b. Colorado Springs, Colo., Jan. 26, 1904; B.A., U. of Calif., 1925, M.A., 1928; Ph.D., 1930; D.Phil., King's Coll., Cambridge U., England, 1936; National Research Council fellow, Copenhagen, Denmark, 1930-31, Cambridge, England, 1931-32; lecturer and demonstrator in physiology, Cambridge, 1932-33; instructor biochemical sciences, Harvard U., 1933-36; assistant professor biochemistry, Mayo Foundation, Rochester, Minn., 1936, asso. prof., 1937; asso. prof. physiology and phys. edn., U. of Minnesota, 1937-39, prof., 1939-46; professor School of Public Health since 1946; research associate, Woods Hole Oceanographic Institute, 1933-34; organizer and mgr. Internat. High Altitude Expdn. to Chile, Mar.-Sept. 1935; Member of OSRD and responsible investigator, 1942-46; spl. cons. on foods to Sec. War 1940-43; chmn. Joint FAO/WHO Expert Com. on Nutrition, 1951; expert cons. WHO, FAO, and UNESCO; chairman of FAO calorie com.; coordinator Internat. Coop. Research Epidemiol. Heart Disease in Finland, Yugoslavia, Holland, Italy, Greece,. Decorated comdr. Order of Lion (Finland); Internat. Soc. Cardiology (chmn. research com. 1963-64).

Representative Publications:

Lessons from serum cholesterol studies in Japan, Hawaii and Los Angeles. Annals of Internal Medicine, 48:83-94, 1958.

Coronary heart disease among Minnesota business and professional men followed fifteen years. Circulation, 28:381-395, 1963.

The role of the diet in human atherosclerosis and its complication. Pp. 263-299 in Atherosclerosis and Its Origin (Chapter 8). M. Sandler and G. H. Bourne, eds., Academic Press, 1963.

Serum cholesterol response to changes in dietary lipids. American Journal of Clinical Nutrition, 19:175-181, 1966.

Epidemiological studies related to coronary heart disease: characteristics of men aged 40-59 in seven countries. Acta Medica Scandinavica Supplement, 460, 392 pp., 1967.

McHUGH, PROF. RICHARD B., Professor and Director, Division of Biometry. b. Villard, Minn. Oct. 25, 1923; B.A. Minnesota 1944; M.A. 1949; Ph.D. 1955. Assist. Prof. Statistics and Psychology, Iowa State Univ. 1950-54; Associate Prof. 1954-56. Assoc. Prof. Biometry, Minnesota 1956-61; Prof. 1961-68; Prof. and Director, Division of Biometry 1968- . Experimental design; bioassay; sample surveys; epidemetrics; demography.

"The Biometry of an Isotope Displacement Immunologic Micro Assay," Mathematical Biosciences, 1968, 319-338 (with C. L. Meinert).

"Negative Variance Estimates and Statistical Dependence in Nested Sampling," Journal of the American Statistical Association, 1968, 1000-1004 (with P. W. Mielke).

"Long-Term Anticoagulant Therapy After Myocardial Infarction," Journal of the American Medical Association, 1969, 2263-2267 (with R. Ebert and others of the Veterans Administration Cooperative Committee).

Leonard Michael Schuman, Professor of Epidemiology. b. Cleveland, March 4, 1913. A.B. Oberlin College, 1934; M.Sc. (fellow hygiene and bacteriology 1937-39), Western Res. U., 1939, M.D. 1940; fellow nutrition Hillman Hosp., Birmingham, Ala., also Vanderbilt U., 1946. U.S. Marine Hosp., Chicago, 1940-41; asst. epidemiologist, Ill. Dept. Pub. Health, 1941-42, dist. health supt., 1942-43, asst. chief div. local health administrn., 1943-45, chief div. venereal disease control, 1947-49, dep. dir. in charge of div. preventive medicine, 1949-54; dir. So. Nutrition Research unit USPHS, 1945-47; epidemiologist Korean cold injury research team U.S. Dept. Def., 1951-53; asso. prof. U. Minn. Med. School, 1954-58; prof. epidemiology, 1958 --; cons. air pollution med. program, National Cancer Institute, Communicable Disease Center USPHS, USDA, Mem. nat. adv. coms. on gamma globulin prophylaxis in poliomyelitis, polio vaccine field trials; mem. Surgeon General's Adv. Com. Smoking and Health; chmn. Conf. Chronic Disease Tng. Program Dirs.; Discovered (with Dr. Thomas Lowry) silo-fillers' disease. Member, National Advisory Committee on Bio-effects of Radiation; Task Force on Smoking and Health; National Advisory Environmental Control Council; Advisory Committee on Health Protection and Disease Prevention to Secretary of H.E.W.

Selected Publications:

Silo-Fillers' Disease - A Syndrome Caused by Nitrogen Dioxide, J.A.M.A. 162: 153-160, 1956.

Efficacy of Poliomyelitis Vaccine, J.A.M.A. 166: 1027-1035, 1958.

Nitrogen Dioxide Poisoning I and II, Arch. Env. Health, 7: 13-32, 1963.

Preconception, Intrauterine, and Postnatal Irradiation as Related to Leukemia in National Cancer Institute Monograph No. 19, pp. 347-371, January 1966.

Relationship of Central Nervous System Neoplasms to Toxoplasma Gondii Infection, Amer. J. P.H. 57: 848-856, 1967.

Alma G. Sparrow, Associate Professor and Director, Program in Public Health Nursing. b. St. Paul, Minnesota, March 9, 1913. B.S., Hamline University, 1937; M.S., Physiology, University of Minnesota, 1943; R.N., 1944; Certificate in Public Health Nursing, 1945; M.P.H., 1953. Instructor in Sciences, Anoka High School, Minnesota, 1937-40; Instructor in Sciences, Benson High School, Minnesota, 1941-42; County Public Health Nurse, McLeod County, Minnesota, 1945-47; Instructor and Public Health Integrator and Science Coordinator, School of Nursing, University of Minnesota, 1947-54; Acting Educational Director and Supervisor, Seattle-King County Health Department, 1954-58; Assistant Professor Nursing, Loma Linda University, 1958-60; Generalized Consultant, Washington State Department of Health, 1960-63; Clinic Coordinator and Assistant Professor of Nursing in Pediatrics, University of Washington, 1962-63; Assistant Professor, Public Health Nursing, 1962-65; Assistant Professor, School of Public Health, University of Minnesota, 1965-66; Associate Professor and Director, Public Health Nursing, 1967 to present.

Selected Publications:

Toxicity of Acetates for Rats. Society for Experimental Biology and Medicine Proceedings, 51:44-45, 1942.

What a Public Health Coordinator Does. American Journal of Nursing, 51:130-132, (Feb.) 1951.

My Child is Mentally Retarded. Nursing Outlook, 10:445-448, (July) 1962.

Prevention Begins at Home. Nursing Outlook, 15:52-54, (Mar.) 1967.

Stewart Craig Thomson, Professor Personal Health and Associate Director. Born in Valley Park, Mississippi, May 3, 1905. B.A., Univ. of Illinois, 1927, M.D., Loyola Univ., Chicago, Ill., 1936, M.S., 1938; postgrad., Univ. of Edinburg, Scotland, 1939; M.P.H., Univ. of Minnesota, 1947. Intern. Mercy Hospital, Chicago, Ill., 1934, Bay City, Michigan, 1935-36; Assoc. Anatomy Loyola University, School of Medicine, 1936-40, Assistant Prof., 1940-46, Asst. Dean, Acting Dean, 1943-46; Asst. Prof. Public Health, Univ. of Minnesota, 1946-47, Assoc. Prof. 1947-53, Asst. Dir. School of Public Health, 1948-57, Prof., Public Health, 1953--, Assoc. Dir. School of Public Health, 1957--; radio spokesman on health, School of the Air, KUOM, 1947--, Served as Capt., Office of Surg. Gen., AUS, 1944-45.

Representive Publications:

Studies of the Anatomy of the Extrahepatic Biliary Tract in Mammalia. Publication 481, Zoological Series, Field Museum of Natural History, 22: 415-30, October, 1940.

The Great Windmill Street School. Bulletin of the History of Medicine, 12:377-391, July, 1942.

Course Content, Methods and Headaches in Teaching Health to College Students. Public Health Reports, 77:789-797, September, 1962.

Study Guide in Hygiene (with R. E. Boynton), 1957.

Diehl's Textbook of Healthful Living (with Harold S. Diehl), revised edition, 1960.

SCHOOL OF PUBLIC HEALTH — TOTAL 16,017

PUBLIC HEALTH-PHYSIOLOGICAL HYGIENE

ROOM	NAME	TOTAL NET S. F.
A1-106	VOLATILE LIQUID STORAGE	58
A1-107	COLD ROOM	78
A1-108	SHOP	230
A1-109	INSTRUMENT LABORATORY	240
A1-110	SERUM LIPID LABORATORY	240
A1-111	BLOOD PREP LABORATORY	240
A1-112	AUTO ANALYSER LABORATORY	240
A1-113	STORAGE	150
A1-114	SUPPLY	190
A1-115	STUDENT OFFICE	72
A1-116	STUDENT OFFICE	72
A1-117	STUDENT OFFICE	72
A1-118	STUDENT OFFICE	72
A1-119	STUDENT OFFICE	72
A1-120	STUDENT OFFICE	72
A1-121	METABOLIC CHAMBER	72
A1-122	OBSERVATION	72
A1-123	TEST AREA	924
A1-123A	TEST AREA	192
A1-124	NUTRITION	395
A1-125	DRESSING	203
A1-126	X-RAY	124
A1-127	OBSERVATION	95
A1-128	E.K.G.	78
A1-129	E.K.G.	78
A1-130	EXAM	98
A1-131	EXAM	98
A1-132	FREEZER	80
A1-133	KITCHEN	150
A1-134	COLD	80
A1-135	STORAGE	75
A1-136	DATA PROCESSING	770
A1-138	GENERAL OFFICE	462
A1-139	GRAPHIC REPRODUCTION	462
A1-140	FACULTY OFFICE	95
A1-141	FACULTY OFFICE	95
A1-142	FACULTY OFFICE	95
A1-143	FACULTY OFFICE	95
A1-144	DIRECTOR'S OFFICE	190
A1-145	FACULTY OFFICE	120
A1-146	FACULTY OFFICE	120
A1-147	FACULTY OFFICE	120
A1-148	FACULTY OFFICE	92
A1-149	FACULTY OFFICE	92
	TOTAL	7720

PUBLIC HEALTH-EPIDEMIOLOGY

ROOM	NAME	TOTAL NET S. F.
A1-151	DIRECTOR'S OFFICE	264
A1-152	SECRETARY	96
A1-153	RECEPTION-SECRETARY	96
A1-154	CLERICAL POOL	325
A1-155	FILE ROOM	150
A1-156	GRAPHICS WORKROOM	168
A1-157	WORKROOM	364
A1-158	TEACHING MATERIAL STORAGE	95
A1-159	SEMI-ACTIVE RECORDS	190
A1-160	GENERAL SUPPLY	118
A1-161	PHOTO WORKROOM	115
A1-162	FACULTY OFFICE	143
A1-163	FACULTY OFFICE	143
A1-164	FACULTY OFFICE	143
A1-165	FACULTY OFFICE	143
A1-166A	READING ROOM	280
A1-168	INSTRUMENT ROOM	184
A1-169	BALANCE ROOM	100
A1-170	EQUIPMENT ROOM	180
A1-171	STATISTICAL ANALYSIS	590
A1-172	STUDENT OFFICE	106
A1-173	STUDENT OFFICE	106
A1-174	FIELD STAFF	220
A1-175	FIELD STAFF	220
A1-176	STUDENT OFFICE	106
A1-177	STUDENT OFFICE	106
A1-178	FACULTY OFFICE	129
A1-179	FACULTY OFFICE	129
A1-180	LABORATORY	221
A1-181	LABORATORY	221
A1-182	LABORATORY	221
A1-183	LABORATORY	221
A1-184	FACULTY OFFICE	141
A1-185	FACULTY OFFICE	141
A1-186	STATISTICAL ANALYSIS	185
A1-187	COLD ROOM	95
A1-188	MEDIA PREPARATION	231
A1-189	CLEANING & STERILIZATION ROOM	231
A1-190	FILE ROOM	150
A1-191	SECRETARY	98
A1-192	GENERAL SUPPLY	138
	TOTAL	7303

PUBLIC HEALTH-SHARED FACILITIES

ROOM NUMBER		TOTAL NET S. F.
A1-137	RECEPTION	138
A1-150	CONFERENCE ROOM	194
A1-166	STUDY	376
A1-167	CONFERENCE ROOM	286
	TOTAL	994

BASIC SCIENCES TEACHING LABORATORIES AND SUPPORT — TOTAL 38,375

ROOM	NAME	MEDICAL UNDER-GRAD TEACHING	MEDICAL GRADUATE TEACHING	DENTAL TEACHING	APPLI-CANTS	TOTAL NET
BIOCHEMISTRY					TOTAL	8,325
A2-150	TEACHING LAB	752	192	288	368	1,600
A2-151	COLD ROOM	116	30	44	56	246
A2-152	TEACHING LAB	752	192	288	368	1,600
A2-153	INSTRUMENT RM., DRY	116	30	45	57	248
A2-154	INSTRUMENT RM., WET	100	26	38	49	213
A2-155	STOCK & DISPENSING RM	238	61	91	117	507
A2-156	OFFICE	41	10	16	20	87
A2-157	DARK ROOM	32	8	12	15	67
A2-158	COLD ROOM	116	29	44	57	246
A2-159	DEMONSTRATION ROOM	90	23	35	44	192
A2-160	GLASS WASH & CLEANUP	85	22	33	42	182
A2-161	TEACHING LABORATORY	752	192	288	368	1,600
A2-162	ADVANCED STUDENT LAB	722	184	277	354	1,537
	TOTAL	3,912	999	1,499	1,915	8,325
MICROBIOLOGY					TOTAL	8,657
A2-164	WALK-IN REFRIG. RM.	26	10	17	67	120
A2-165	STERILE ROOM	30	11	19	78	138
A2-166	MEDIA PREP ROOM	82	31	53	214	380
A2-167	CENTRAL STERILE	107	40	70	280	497
A2-168	CENTRAL GLASS & DISPOSAL ROOM	89	33	58	233	413
A2-169	STORAGE ROOM	66	24	42	171	303
A2-170	TEACHING LAB	255	94	165	666	1,180
A2-171	OFFICE	22	8	14	56	100
A2-172	GLASSWARE, REAGENT & DISPEN.	80	30	52	210	372
A2-173	DEMONSTRATION ROOM	220	81	143	575	1,019
A2-174	TEACHING LAB	258	96	168	675	1,197
A2-175	WALK-IN REFRIG.	27	10	17	69	123
A2-176	STORAGE	44	16	29	115	204
A2-177	TEACHING LAB	255	94	165	666	1,180
A2-178	MICRO-PREP ROOM	167	62	109	437	775
A2-179	WALK-IN REFRIG.	23	8	15	60	106
A2-180	MYCOLOGY MUSEUM LAB	28	11	18	74	131
A2-181	BACTERIA VIRUS LAB	39	14	25	100	178
A2-182	STORAGE	22	8	15	58	103
A2-183	WOMEN'S LOCKER, TOILET	30	11	19	78	138
	TOTAL	1,870	692	1,213	4,882	8,657

BASIC SCIENCES TEACHING LABORATORIES AND SUPPORT (CON'T)

ROOM	NAME	MEDICAL UNDER-GRAD TEACHING	MEDICAL GRADUATE TEACHING	DENTAL TEACHING	APPLI-CANTS	TOTAL NET S.F.
PHARMACOLOGY					TOTAL	7,351
A3-110	PREPARATION ROOM (SHARED)	49	9	19	13	90
A3-111	DEMONSTRATION ROOM (SHARED)	444	81	169	113	807
A3-120	LABORATORY	428	78	163	109	778
A3-121	STORAGE	58	11	22	15	106
A3-122	LABORATORY	433	79	165	110	787
A3-123	LABORATORY	429	78	164	109	780
A3-124	STORAGE	231	42	88	59	420
A3-125	INSTRUMENT ROOM	119	22	45	30	216
A3-126	DISPENSING AND PREP	246	45	54	63	448
A3-127	INSTRUMENT ROOM	119	22	45	30	216
A3-128	COLD ROOM	110	20	42	28	200
A3-129	COLD ROOM	110	20	42	28	200
A3-130	LABORATORY	423	77	162	108	770
A3-131	LABORATORY	423	77	162	108	770
A3-132	LABORATORY	420	76	160	107	763
	TOTAL	4,042	737	1,542	1,030	7,351
PATHOLOGY					TOTAL	6,820
A2-120	REFERENCE & STUDY ROOM	850	29	561	-	1,440
A3-100	STORAGE-TEACHING MATERIALS	302	10	200	-	512
A3-101	LABORATORY	469	16	310	-	795
A3-102	STORAGE	63	2	41	-	106
A3-103	LABORATORY	459	16	303	-	778
A3-104	TISSUE STRAINING & PREP	459	16	303	-	778
A3-105	LABORATORY	459	16	303	-	778
A3-106	GROSS SPECIMEN MUSEUM	432	15	285	-	732
A3-107	LABORATORY	469	16	310	-	795
A3-108	STORAGE	63	2	41	-	106
	TOTAL	4,025	138	2,657		6,820

BASIC SCIENCES TEACHING LABORATORIES AND SUPPORT (CON'T)

ROOM	NAME	MEDICAL UNDER-GRAD TEACHING	MEDICAL GRADUATE TEACHING	DENTAL TEACHING	PUBLIC HEALTH	APPLI-CANTS	TOTAL NET S.F.
PHYSIOLOGY						TOTAL	7,222
A3-110	PREP ROOM (SHARED)	34	13	18	11	14	90
A3-111	DEMONSTRATION (SHARED)	306	113	161	97	129	806
A3-112	STOCK & PREP ROOM	539	198	283	170	226	1,416
A3-113	INSTRUMENT ROOM	141	52	74	44	59	370
A3-114	LABORATORY	296	109	156	94	125	780
A3-115	LABORATORY	299	110	157	95	126	787
A3-116	LABORATORY	296	109	156	93	124	778
A3-117	LABORATORY	299	110	157	95	126	787
A3-118	LABORATORY	296	109	156	93	124	778
A3-119	LABORATORY	239	88	126	76	101	630
	TOTAL	2,745	1,011	1,444	868	1,154	7,222

GRAND TOTAL FOR BASIC SCIENCE TEACHING LABORATORIES AND SUPPORT

16,594	3,577	8,355	868	8,981	38,375

SHARED CLASSROOMS AND STUDENT FACILITIES — TOTAL 26,488

SHARED CLASSROOMS — TOTAL 23,247

ROOM	NAME	MEDICAL UNDER-GRAD TEACHING	MEDICAL GRADUATE TEACHING	DENTAL TEACHING	PUBLIC HEALTH	APPLI CANTS	TOTAL NET
A2-100	SEMINAR	241	5		11	11	268
A2-101	SEMINAR	241	5		11	11	268
A2-102	SEMINAR	241	5		11	11	268
A2-103	SEMINAR	199	4		9	10	222
A2-104	SEMINAR	174	4		8	8	194
A2-105	SEMINAR	174	4		8	8	194
A2-106	SEMINAR	174	4		8	8	194
A2-107	STORAGE	21	8	45	24	14	112
A2-108	DISCUSSION ALCOVE	23	8	48	25	16	120
A2-109	AUDITORIUM-200 SEAT	470	168	988	518	316	2460
A2-110	PROJECTION ROOM	23	8	48	25	16	120
A2-111	DISCUSSION ALCOVE	21	8	45	24	14	112
A2-113	CLASSROOM-50 SEAT	120	43	253	133	81	630
A2-114	STORAGE	18	7	39	20	12	96
A2-115	STORAGE	18	7	39	20	12	96
A2-116	CLASSROOM-50 SEAT	120	43	253	133	81	630
A2-117	STORAGE	18	7	39	20	12	96
A2-118	CLASSROOM-50 SEAT	120	43	253	133	81	630
A2-121	CLASSROOM-100 SEAT	220	78	461	242	148	1150
A2-122	STORAGE	39	14	83	43	27	206
A2-123	CLASSROOM-15 SEAT	233	5		11	11	260
A2-124	CLASSROOM-15 SEAT	233	5		11	11	260
A2-125	CLASSROOM-15 SEAT	233	5		11	11	260
A2-126	CLASSROOM-20 SEAT	262	6		12	12	292
A2-127	CLASSROOM-20 SEAT	262	6		12	12	292
A2-128	CLASSROOM-20 SEAT	262	6		12	12	292
A2-129	AUDITORIUM-250 SEAT	544	194	1145	600	367	2850
A2-130	PROJECTION ROOM-CCTV	42	15	89	46	28	220
A2-131	SEMINAR	242	5		11	12	270
A2-132	DISCUSSION ALCOVE	23	8	48	25	16	120
A2-133	PREPARATION ROOM	149	53	314	165	101	782
A2-134	AUDITORIUM-250 SEAT	544	194	1145	600	367	2850
A2-135	DISCUSSION ALCOVE	23	8	48	25	16	120
A2-136	PROJECTION ROOM-CCTV	42	15	89	46	28	220
A2-137	SEMINAR	242	5		11	12	270
A2-138	PROJECTION ROOM-CCTV	51	18	106	56	34	265
A2-139	DISCUSSION ALCOVE	27	10	58	30	19	144
A2-140	DISCUSSION ALCOVE	27	10	58	30	19	144
A2-141	STORAGE	10	4	22	11	7	54
A2-142	SEMINAR	205	4		9	10	228
A2-143	SEMINAR	213	6		9	10	238
A2-144	AUDITORIUM-350 SEAT	796	284	1675	878	537	4170
A2-145	REAR PROJECTION ROOM	111	39	233	122	75	580
	TOTAL	7451	1378	7625	4169	2624	23,247

SHARED CLASSROOMS AND STUDENT FACILITIES (CON'T)

ROOM	NAME	MEDICAL UNDER-GRAD	MEDICAL GRADUATE TEACHING	DENTAL TEACHING	PUBLIC HEALTH	APPLI-CANTS	TOTAL NET
STUDENT FACILITIES						TOTAL	3,241
A2-112	STUDENT STUDY & LOUNGE	415	148	873	458	280	2,175
A2-119	STUDENT SUPPLY CENTER	204	73	429	224	137	1,066
	TOTAL	619	221	1,302	682	417	3,241

GRAND TOTAL OF SHARED CLASSROOMS AND STUDENT FACILITIES

8,070	1,599	8,927	4,851	3,041	26,488

SERVICE FACILITIES — TOTAL 15,219

ROOM	NAME	MEDICINE	DENTISTRY	PUBLIC HEALTH	APPLICANTS SPACE	TOTAL NET S.F.
AB-100	BUILDING & PLANT SERVICES	2,156	6,525	717	434	9,832
A1-100	SUPPLY STORAGE & RECEIVING	664	2,009	221	133	3,027
A2-163	JANITOR	23	14	4	9	50
A2-184	JANITOR	60	42	18	36	156
A3-133	JANITOR	56	24	4	10	94
A4-143	JANITOR	-	130	-	-	130
A5-143	JANITOR	-	80	-	-	80
A5-144	RECEIVING	-	80	-	-	80
A6-231	JANITOR	-	75	-	-	75
A6-232	RECEIVING	-	80	-	-	80
A7-172	JANITOR	-	120	-	-	120
A7-173	RECEIVING	-	80	-	-	80
A8-172	JANITOR	-	120	-	-	120
A8-173	RECEIVING	-	80	-	-	80
A9-196	JANITOR	-	120	-	-	120
A9-197	RECEIVING	-	80	-	-	80
A11-102	JANITOR	30	-	-	-	30
A12-133	JANITOR	125	-	-	-	125
A13-110	JANITOR	30	-	-	-	30
A14-117	JANITOR	30	-	-	-	30
A15-142	JANITOR	-	80	-	-	80
A15-143	RECEIVING	-	80	-	-	80
A16-161	JANITOR	-	80	-	-	80
A16-162	RECEIVING	-	80	-	-	80
A17-162	JANITOR	-	80	-	-	80
A17-163	RECEIVING	-	80	-	-	80
A18-157	JANITOR	-	80	-	-	80
A18-158	RECEIVING	-	80	-	-	80
A19-124	JANITOR	-	80	-	-	80
A19-125	RECEIVING	-	80	-	-	80
TOTAL		3,174	10,459	964	622	15,219

APPLICANT'S SPACE TOTAL 1,114

ROOM	NAME	TOTAL NET S.F.
A1-193	APPLICANTS SPACE	557
A1-194	APPLICANTS SPACE	557
TOTAL		1,114

SCHOOL OF PUBLIC HEALTH

PRESENT LOCATIONS
40,520 NSF

1
BIOSTATISTICS
1,274 NSF

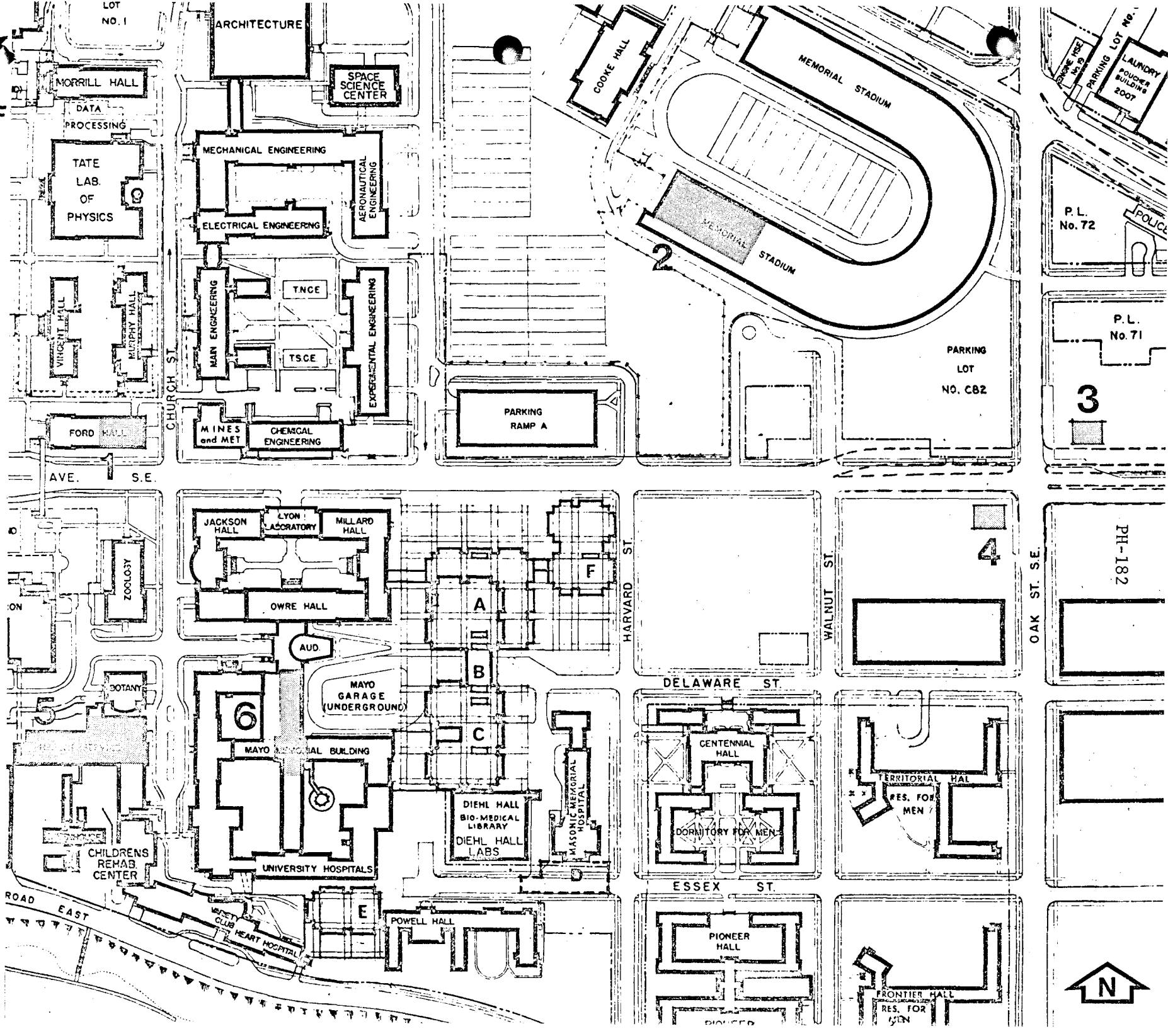
2
PHYSIOLOGICAL HYGIENE
10,881 NSF

3
HOSPITAL ADMINISTRATION
1,294 NSF

4
HOSPITAL ADMINISTRATION
545 NSF

5
ENVIRONMENTAL HEALTH
8,737 NSF

6
ALL DIVISIONS EXCEPT PHYSIOLOGICAL HYGIENE
17,789 NSF



SCHOOL OF PUBLIC HEALTH

PHASE 1
COMPLETED
83.180 NSF

1
BIOSTATISTICS
1,274 NSF

2
PHYSIOLOGICAL HYGIENE
10,881 NSF

3
ENVIRONMENTAL HEALTH
8,737 NSF

4
ENVIRONMENTAL HEALTH
12,283 NSF

5
EPIDEMIOLOGY
7,303 NSF
PHYSIOLOGICAL HYGIENE
7,720 NSF
GEN. PURPOSE
994 NSF

6
ALL OTHER DIVISIONS
33,988 NSF