Changing Patterns of Hospitalization for Psychiatric Disorders

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PSYCHIATRIC disorders are unique among illnesses in the United States in terms of the patterns of care which have evolved. Not only are psychiatric patients usually treated separately from general medical patients, but apparently three more or less independent groups of psychiatric patients are treated by three very different systems. Children and adolescents are most commonly treated as outpatients in community mental health clinics. Adults who are able to pay for psychiatric care tend to be seen by psychiatrists in private practice and are hospitalized (when indicated) in private psychiatric hospitals or in psychiatric units of general hospitals, where they continue to be treated by psychiatrists from the private sector. Adults who are unable to afford private psychiatric care tend to enter public psychiatric hospitals, where they are generally treated without charge by salaried psychiatrists and the wide variety of other mental health professionals commonly employed in such settings. Bahn and associates (*1*) and Gardner and associates (*2*), among others, have established communitywide psychiatric case registers which have helped us understand these patterns of psychiatric care.

Periodic review of the patterns of psychiatric care, particularly of inpatient care, is especially needed at this time when increasing emphasis is being placed upon improvement of the organization and delivery of psychiatric services by means of community mental health programs. The Federal Government is supporting the costs of construction and of initial staffing of comprehensive community mental health centers with the hope of establishing, within the community and under one administrative roof, a full range of services for all psychiatric patients in a specified catchment area regardless of age, sex, diagnosis, or financial status. The community general hospital is seen as a potential major resource in this new broadened service plan. In addition to the influence of this national mental health program, the accelerating availability of third-party prepaid medical insurance programs suggests that the patterns of psychiatric care may be undergoing unusually rapid change.

Objectives and Methods

In 1964, I was presented an unusual opportunity to study patterns of inpatient medical care for psychiatric conditions, based on an analysis of public and private hospitalizations in Pueblo, Colo., between 1959 and 1961. A full range of public and private psychiatric facilities was readily available in Pueblo or near by, and each hospital, whether public or private,

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permitted me to use data from its records for this study. (For further background on this study, see reference *3*.) One of the objectives of the data collection was to identify, as completely as possible, all Pueblo residents who had been hospitalized for the first time in either public or private inpatient facilities for a psychiatric disorder during the study period, regardless of the location of the treatment facility. The purpose of my paper is to present the results of this phase of the study and to contrast them with those obtained during the previous decade in order to identify changing patterns of psychiatric hospitalization.

I had the records of five public and three private or general hospitals searched to identify those patients who experienced their first significant psychiatric hospitalization during the years 1959–61. In my study, the major distinction between the public hospitals, on the one hand, and the private and general hospitals, on the other hand, was that fees were charged in the private and general hospitals but not in the public. A significant hospitalization was defined as one lasting longer than 24 hours in which a psychiatric disorder was diagnosed and a treatment formulated. The public hospitals included a State psychiatric hospital in Pueblo, a university psychiatric hospital in Denver, a second State hospital in Denver (which for a brief period during the study years had admitted patients from Pueblo), and two Veterans' Administration hospitals in the State with facilities for psychiatric treatment. The private facilities included a large general hospital with a psychiatric unit and a small private psychiatric hospital, both in Pueblo, and a large private psychiatric hospital in Colorado Springs, 40 miles from Pueblo. These hospitals were the only ones within a reasonable distance from Pueblo which had facilities for psychiatric treatment.

In identifying the patients to be included in the investigation, I established several ground rules.

1. A patient who had lived in the county less than 30 days was not included.

2. No patient was included when there was evidence of a prior significant psychiatric hospitalization.

3. Patients diagnosed by psychiatrists as having either a primary or secondary psychiatric condition were included.

4. Patients with a primary psychiatric diagnosis made by a nonpsychiatric physician were included.

5. Patients with a secondary psychiatric diagnosis (for example, congestive heart failure, anxiety) made by a nonpsychiatric physician were not included unless psychiatric consultation had been used in the diagnostic process.

6. Patients with a primary diagnosis of mental retardation and no secondary psychiatric diagnosis were not included. (The hospitalization of these patients was apparently a step in the process of commitment to a State institution for the mentally retarded.)

7. Patients admitted to general hospitals with a primary diagnosis of alcoholism made by a nonpsychiatric physician were included only when the case record showed evidence of habituation.

For each patient included in the investigation I obtained information regarding his age, sex, diagnosis, and type of facility (public or private). Duplicate cases were eliminated by retaining only the record of the patient's first hospitalization after January 1, 1959.

Psychiatric Hospitalization Patterns

Information regarding admissions and admission rates for Pueblo County is presented in table 1. This table shows that 919 patients were identified as receiving their first significant psychiatric inpatient treatment during the 3-year period, equivalent to a rate of 2.72 first admissions per 1,000 population per year. The patients were grouped into four major psychiatric diagnostic classifications. Those with the functional psychoses, including schizophrenic and manic-depressive reactions, constituted only about 12 percent of the total group. The largest single diagnostic group was comprised of patients with psychoneurotic and psychosomatic disorders, a category including nearly one-third of the patients. Approximately 30 percent of the patients were classified as having acute or chronic brain syndromes and about one-quarter as having personality disorders (primarily alcoholism).

Total admission rates are related to age and climb rapidly as it increases. The admission rate

was fairly constant between ages 20 and 64, averaging between three and four cases per 1,000 population per year. The rate was considerably lower in the age group under 20 and considerably higher in the age group 65 and over. Only 36 percent of all the patients studied were hospitalized in public facilities. The more frequent use of private facilities is not consistent, however, being related both to diagnosis and age.

Private facilities were used much more often than public facilities by patients with psychoneuroses and psychosomatic disorders, personality disorders, and functional psychotic reactions. Patients with acute or chronic brain syndromes, however, used public facilities almost twice as often as private. Admissions to private facilities were nearly twice as common as admissions to public facilities in the age group under 20. This differential persisted through age 64, admissions in the 20–64 age group being about three times more common to private facilities than to public. In the group 65 years and over, however, the age-specific admission rate to public facilities exceeded that to private. The choice of the type of facility for hospitalization was clearly specific for age and diagnosis. In spite of the generally more frequent use of private facilities, the chance that, for example, a patient who was 65 or over and suffering with an acute or chronic brain syndrome would be hospitalized in a private or general hospital was only half that of his being sent to a State or other public governmental facility.

In further contrast, more than half of all patients admitted to public facilities were diagnosed as having acute or chronic brain syndromes, but only 16 percent of the patients admitted to private facilities were so diagnosed. While the diagnoses of nearly half of the patients admitted to private facilities were in the category of psychoneurotic and psychosomatic disorders, only 7 percent of the patients in public hospitals were so diagnosed. As might be expected from the high proportion of patients with brain syndromes in public facilities, the older patients were overrepresented here. More than 43 percent of the patients admitted to public facilities were age 65 and over. Only 17 percent of the private patients were in this age group.

More than 90 percent of all hospitalized psychoneurotics used private facilities. At the other extreme, only one-third of all hospitalized patients with acute and chronic brain syndromes used private facilities. In general, younger patients with relatively mild or acute

Table 1. Numbers of first admissions and first admission rates, by patient's diagnosis, type of psychiatric inpatient facility, and age group, Pueblo, Colo., 1959–61

Diagnosis and type of facility	Under 20 years		20–34 years		35–64 years		65 years and over		Total	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Psychoneurotic and psychosomatic disorders:										
Public	0	0.0	5	0.08	17	0.16	1	0.04	23	0.07
Private	24	.16	90	1.47	137	1.33	21	.78	272	.81
Personality disorders and transient situational personality disorders, including alcoholism and sociopathic reactions:										
Public	19	.13	20	.33	46	.45	2	.07	87	.26
Private	16	.11	24	.39	101	.98	10	.37	151	.45
Functional psychotic reactions:										
Public	5	.03	14	.23	16	.15	3	.11	38	.11
Private	10	.07	26	.43	32	.31	7	.26	75	.22
Acute and chronic brain syndromes:										
Public	5	.03	11	.18	28	.27	136	5.03	180	.53
Private	4	.03	5	.08	21	.20	63	2.33	93	.28
Total:										
Public	29	0.20	50	0.82	107	1.04	142	5.28	328	0.97
Private	54	.37	145	2.37	291	2.82	101	3.74	591	1.75

NOTE: The numbers represent the unduplicated 3-year count; the rates are per 1,000 population at risk per year.

conditions apparently used the private facilities, while older patients with more severe and chronic conditions tended to use the public ones.

Analysis of sex differences in the medical care patterns suggests that, while total admission rates were approximately equal for the two sexes, several major differences in hospital use exist. First, admissions in the psychoneurotic and psychosomatic category were twice as common for females as for males, and admissions in the category of personality disorders were four times more common for men than for women. While 45 percent of the hospitalized women were in the psychoneurotic category, only 20 percent of the men were in this category. Forty-one percent of the men were in the group with personality disorders, but only 10 percent of the women. Second, private facilities were used by 70 percent of the women but by only 59 percent of the men. In the younger ages, this differential in use is even more striking. Among patients under 65 years of age, 84 percent of the women were hospitalized in private facilities in comparison with only 63 percent of the men. The importance of age at admission in determining a woman's place of hospitalization is further underlined by the fact that, while more than eight of 10 of the women under age 65 were hospitalized in private facilities, fewer than four of 10 over 65 used private facilities.

I have examined the rates of first admission in the Monroe County, N.Y., case register for 1960, as reported by Gardner and associates (*2*), and the total admission rates less returns to State mental hospitals from long-term leaves in the Maryland case register for 1962, as reported by Bahn and associates (*1*), and then compared these rates with those for Pueblo.

In Monroe County, the rates of first admission followed the general pattern I found for Pueblo. The rates increased with age, private facilities were generally used oftener than public (particularly by the younger women), and the aged and patients with brain syndromes used public facilities excessively. The Maryland figures, when comparably collected and analyzed, indicated admission rates of approximately equal magnitude and of a similar pattern to those for Pueblo and Monroe County. The general admission rate to inpatient facilities in Maryland was about four per 1,000 per year during the adult years, with rates considerably lower under age 20 and higher over age 65. The distribution to types of facilities by diagnosis was such that patients with milder disorders were more heavily represented in private facilities while those with brain syndromes were more commonly seen in public institutions.

I have also examined first admission rates into public and private inpatient psychiatric facilities in the total United States, as reported by the National Institute of Mental Health for 1966 (*4*), and contrasted these rates with those for Pueblo. While the patterns of admission of patients by sex and diagnosis appear to be similar, the magnitude of the reported rates of first admission is substantially lower in the total United States than that found in Pueblo, particularly for admission to private facilities. Several factors should be noted in this connection. First, Veterans' Administration hospitals were not included in the total U.S. figures. Second, underreporting, particularly by private facilities, is much more difficult to control at the national level than at the local. The reported admission rates are consistently higher in case register areas than in the total United States. Third, admission rates are clearly a function of the availability of beds and in Pueblo, as in many other communities, inpatient beds are in more abundant supply than in the nation as a whole. In addition, psychiatric care is generally more readily available in urban than in rural areas in the United States. Fourth, if all patients coming from a particular community, including those residents who leave that community to secure their psychiatric care, are counted in tabulating the number of admissions to inpatient psychiatric facilities, the admission rates obtained will necessarily be increased.

Trends in Hospitalization Patterns

Three major epidemiologic studies of patients hospitalized for psychiatric disorders have been reported since 1950. The results of these studies can be compared with those for Pueblo. Because of differences in case definition and diagnostic groupings, however, the results should be interpreted somewhat tentatively. Hollingshead and Redlich (*5*) studied both the incidence and period prevalence of treated psychiatric disorders in metropolitan New Haven, Conn., be-

tween June and December of 1950. Srole and associates (*6*) studied the point prevalence on May 1, 1953, of treated and untreated psychiatric patients aged 20–59 in the midtown Manhattan area. Dunham (*7*) studied an unduplicated universe of psychiatric patients with functional disorders who were identified between 1956–58 as of their first visit to an inpatient or outpatient treatment facility located in either of two subcommunities of Detroit.

In all of these studies, including mine in Pueblo, a geographic catchment area was defined, and an effort was made to locate the patients residing in this area regardless of where they were treated. In each study, inpatient treatment facilities were classified as private or public, according to whether a fee was charged for hospital and medical services. Hollingshead and Redlich (*5*) examined the records of 11 public and 10 private hospitals. Srole and associates (*6*) studied the records of 13 public and 41 private hospitals. Dunham (*7*) examined the records of 13 public and 19 private hospitals. I could locate the patients from Pueblo reasonably well by examining records of only five public and three private hospitals.

The extremely rapid increase in the use of private inpatient facilities can be seen by comparing the use of public and private inpatient facilities that is reported in these four studies (table 2). The extent to which this trend is of general significance, however, cannot be confidently evaluated, since no single geographic area has been studied at two different times. Because the Pueblo community has a smaller proportion of very poor inhabitants than some of the older eastern communities, it may be able to make greater use of private facilities. The extent of prepaid insurance coverage available to the populations under study has undoubtedly increased since 1950, resulting in a greater use of private facilities (*8*, *9*), but there are no specific data indicating that this increase has been of the same magnitude in different geographic areas.

The evidence linking particular diagnostic categories to changes in the use of public or private inpatient facilities is somewhat indirect. In 1950 and 1953, so few patients used private psychiatric facilities that diagnosis-specific rates of use for these years would not be expected to yield significant differences. The Dunham data for 1956–58, however, show the proportions of hospitalized patients with various diagnoses who used public psychiatric facilities (*7a*). Of the patients with schizophrenia who were hospitalized, the proportion was 83.6 percent. In a hospitalized group including most of the psychopathic patients, some of the patients with addictions, and those patients admitted to psychiatric facilities without being given a diagnosis, 80.9 percent used public facilities. Of a third group, which included patients with diagnoses of cyclothymic, involutional, psychoneurotic, or schizoid personalities, the proportion in public psychiatric hospitals was 57.4 percent.

Comparison of the results of the earlier studies with those for Pueblo suggests that between 1950 and 1960 the use of private facilities increased significantly, particularly for milder psychiatric disorders. That this increased use of private facilities is related to the advent of prepaid hospital and medical insurance seems clear. Hollingshead and Redlich (*5a*), in discussing expenditures for psychiatric treatment as of 1950, do not specifically identify third-party prepaid insurance in conjunction with such expenditures. Since at that time there were

Table 2. Use of public and private inpatient facilities by patients with psychiatric disorders, as reported in four studies

Authors and periods of study	Number of patients studied	Public facilities		Private facilities	
		Number	Percent	Number	Percent
Hollingshead and Redlich, June–December 1950 (*5b*)	1,378	1,341	97.4	37	2.6
Srole and associates, May 1, 1953 (*6b*)	1,288	1,127	87.5	161	12.5
Dunham, 1956–58 (*7b*)	1,838	1,421	77.4	417	22.6
Bloom, 1959–61	919	328	35.7	591	64.3

few sources of support other than out-of-pocket expenditures to pay for the cost of psychiatric hospitalization, the choice of private or public facilities depended almost entirely on the patient's financial status. Srole and associates, in reviewing their results and contrasting them with the earlier ones of Hollingshead and Redlich, suggest that "if the inescapable calculus of cost relative to financial means is not the only factor determining whether and where psychiatric care is sought and secured, it probably is one of the most important" (*6a*).

The shifts in the patterns of psychiatric care between 1950 and 1960 were clearly nonrandom, favoring private care for the milder acute disorders over the more severe chronic conditions, and also for women over men and for younger persons over older. In addition to changes in the modes of payment for inpatient psychiatric care, the advent of psychoactive drugs, along with the accelerating establishment of psychiatric units in general hospitals, helps account for these shifts. During the decade 1960–70, a study of the continuing changes in the patterns of inpatient psychiatric care should show the growing influence of Medicare and Medicaid legislation and the influence of community mental health centers.

If general hospital medical facilities are to be used for the whole range of psychiatric disorders, innovative treatment techniques will have to be found for the patients currently overrepresented in public facilities. If these new techniques result in more effective treatment than is currently being provided, the community mental health center program may be successful. If, however, the effectiveness of treatment is not increased and these new techniques simply result in the establishment of alternate sites for the hospitalization or care of certain subclasses of psychiatric patients, we will not have advanced much beyond the present pattern of offering these groups admittedly inadequate psychiatric facilities.

Summary

The rates of first admission for psychiatric disorders of residents of Pueblo, Colo., to both public and private facilities during the period 1959–61 were determined and contrasted with the rates in earlier studies in other communities. The crude total rate of first admission was found to be 2.72 per 1,000 population per year. The admission rate varied, however, by age, sex, diagnosis, and type of facility (public or private). Admission rates climbed rapidly with age regardless of sex or diagnosis. More than 60 percent of all the patients were hospitalized in private facilities. Only 12 percent were diagnosed as functional psychotics. Nearly one-third of the patients had conditions diagnosed as psychoneurotic or psychosomatic disorders; 30 percent had acute or chronic brain syndromes; about one-quarter had personality disorders (primarily alcoholism). The total admission rates for males and females were nearly equal. However, admissions in the psychoneurotic category were twice as common for females as for males, while admissions for personality disorders were four times more common for males than for females. Except for patients over age 65 and those with acute and chronic brain syndromes, the rates of admission to private facilities were higher than to public facilities.

In comparison with earlier studies, the study in Pueblo showed what appears to be a significant trend toward increased use of private facilities, but the trend was not uniform. If the community mental health center program is to succeed, general hospitals with psychiatric facilities will have to establish effective treatment programs for the patients who are currently underrepresented there.

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Tearsheet Requests

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Grants to Eight New Comprehensive Health Centers

Grants under the Partnership for Health Program totaling almost $4 million have been awarded to eight comprehensive health services projects in an effort to make high-quality comprehensive health services accessible, affordable, and acceptable to people who need them most. There are now 20 comprehensive health service projects supported by grants from this program.

Four of the projects will be located in Model Cities areas in Dade County, Fla., Dayton, Ohio, East St. Louis Ill., and Tuscon, Ariz. The other projects will be in Boston, Mass., Washington, D.C., Randolph County, W. Va., and five delta counties in Mississippi. The eight awards were as follows:

$726,581 to Memorial General Hospital Association, Inc., of Elkins, W. Va., to set up a family health service in Randolph County. The service will integrate existing medical and social services primarily by recruiting and training 24 family health workers from rural areas who will live and work in their home communities. Backup physicians' services, hospitalization, and other needed services will be made available to bring the area's disadvantaged residents into the mainstream of health care services.

$140,300 to the Harvard Community Health Plan, Inc., for its Health Care for the Poor and $334,200 for the Inception and Buildup Period Support plan. This prepaid group practice plan will offer comprehensive ambulatory care in a modern medical facility to 10,000 low-income residents in the Parker Hill-Mission Hill section of Boston. Inpatient services will be available at several cooperating hospitals in the area.

The plan will attack the high costs of medical care by stressing preventive care, early treatment, greater utilization of all appropriate medical facilities, not just hospitals, and the broader use of auxiliary health personnel wherever possible.

$553,630 to the National Medical Association Foundation in Washington, D.C., for the Shaw Community Health Program.

$400,000 to the Economic Opportunity Family Health Center, Inc., Miami, Fla., for a demonstration project of comprehensive family health care in the Model City area of Dade County.

$300,000 to the University of Mississippi Medical Center, Jackson, Miss., for meeting selected health needs in a target area of Mississippi (five delta counties).

$499,063 to the Model Cities Planning Council and city of Dayton, Ohio, for the Charles R. Drew Neighborhood Health Center.

$457,320 to the Metro-East Health Services Council, East St. Louis, Ill., for the Metro-East Alliance for Health.

$502,845 to the Board of Regents, University of Arizona, Tuscon, for the Tucson Neighborhood Health Center.

Education Notes

Alcohol and Problems of Addiction. The ninth annual residential summer course in alcohol and problems of addiction will be held May 31–June 12, 1970, at Brock University, St. Catharines, Ontario, Canada. The course will be co-sponsored by Brock University and the Addiction Research Foundation, an agency of the Province of Ontario.

Designed for professionals in law, public administration, medicine, nursing, social work, theology, education, and industry, the course includes basic information and findings of current research relating to the misuse of alcohol and other drugs. Provision is made for thorough discussion of prevention and treatment aspects of addiction problems.

Admissions are controlled to insure a balanced representation of all the disciplines involved. Enrollment is limited to 80 persons.

Inquiries should be addressed to Summer Course Director, Education Division, Addiction Research Foundation, 344 Bloor Street West, Toronto 4, Ont.

Residencies in Dental Public Health. The National Institute of Dental Research, Public Health Service, is offering residencies in dental public health to dentists who have completed 1 academic year of study leading to the degree of master of public health or its equivalent. The program, which will require 1 calendar year, will fulfill the field training and residency requirements of the American Board of Dental Public Health.

The curriculum will emphasize the research aspects of dental public health. Each resident will receive specialized experience in the technical phases of research design, dental epidemiology and biometry, and data processing. He will also be given opportunities to conduct laboratory experiments and to participate in field studies of the microbiological aspects of dental caries. The field studies will be conducted in the United States.

The specific training plan for each resident will be tailored to his individual needs and interests, and an additional 12 months' training may be offered to selected candidates.

Additional information is available from the Chief, Clinical Trials Section, Biometry and Field Investigations Branch, National Institute of Dental Research, Public Health Service, Bethesda, Md. 20014.

Methods of Epidemiological Investigation. The University of North Carolina School of Public Health is offering a course in methods of epidemiologic investigation, April 6–17, 1970. The course will be given in cooperation with the Bureau of Disease Prevention and Environmental Control, National Communicable Disease Center, Public Health Service.

An introductory course for community public health workers, the curriculum is directed primarily toward professional health personnel in State and local health agencies concerned with environmental health, communicable disease, chronic disease, and accident control.

The course is designed to orient environmental and other allied health personnel to the application of epidemiologic methods to community health problems. Participants will study basic principles, methods, and techniques of epidemiology as they relate to specific health problems.

Course content will include environmental health problems in the United States; methods of identifying and describing population characteristics; rates and ratios; introduction to a teaching reference community; presentation of data; measures of central tendency; principles of epidemiology; measures of dispersion, regression, and correlation; probability and tests for significance; survey, sampling, and questionnaire methodology; types of epidemiologic studies; community stratification; epidemiology in the study of the institutional environment and in accident prevention; epidemiology of vector-borne diseases; and epidemiology for accident prevention

and for administrative purposes. Students will be assigned to groups for analysis of selected epidemiologic problems.

Tuition will be $275 excluding room and board. A limited number of traineeships, which will pay tuition and per diem, will be available. Applications should be returned by March 15, 1970.

Additional information and application forms are available from Continuing Education and Field Service, School of Public Health, University of North Carolina, Chapel Hill, N.C. 27514.

Electronic Product Radiation Control. The University of Florida, Gainesville, has expanded its radiological health training program to include a new course, electronic product radiation. The course covers the evaluation of hazards, the application of standards, and the engineering of controls for these types of devices. Microwave devices, microwave survey instruments, lasers, and laser accessories are now available for research and teaching.

The program will draw support from segments of the university and from local industries. Microwave engineering courses and assistance in research are available in the department of electrical engineering. A graduate course in laser technology is taught by the department, and a cross-college graduate level course pertaining to the engineering applications of gas lasers has been recently introduced. Activities at nearby industrial facilities, at the John F. Kennedy Space Center, and of the Florida State Board of Health will provide practical inputs to the program.

A limited number of traineeships will be available during the 1970–71 academic year. Persons interested in pursuing graduate study in radiological health should apply early.

Further information may be obtained from the Department of Environmental Engineering, University of Florida, Gainsville, Fla. 32601.

Medical Radiation Physics. A new program in medical radiation physics will be presented by the Harvard School of Public Health in the 1970–71 academic year. The program will be given in collaboration with the Harvard Medical School at the Peter Bent Brigham Hospital and the Massachusetts General Hospital, Boston.

Training will be offered at the master of science and the doctor of science levels. The master of science program will include a year of formal academic training, primarily at the school of public health, followed by a year of didactic and research training, primarily at one of the hospitals.

Requirements for admission are a bachelor's degree with honor in physics, mathematics, biology, or chemistry from a recognized institution. The deadline for applications is April 1, 1970, but candidates are urged to apply as soon as possible.

Tuition will be $2,400 per year. It is expected that fellowships will be available for U.S. citizens. The fellowships will cover the tuition and include a stipend of about $200 per month.

Additional information is available from Dade W. Moeller, Ph.D., Head, Department of Environmental Health Sciences, Kresge Center for Environmental Health, Harvard University School of Public Health, 665 Huntington Ave., Boston, Mass. 02115.

Environmental Health Fellowships. Under an interdepartmental program to give students broad training for careers in research, teaching, and practice in environmental health, the Consolidated University of North Carolina (Chapel Hill and Raleigh campuses) is offering environmental health fellowships for graduate study during 1970–71. Postdoctoral fellowships are also available.

The program is sponsored jointly by the departments of environmental sciences and engineering, biostatistics, and epidemiology of the School of Public Health; the departments of city and regional planning, zoology, botany, chemistry, and geology of the School of Arts and Sciences; and the department of food science at North Carolina State University at Raleigh.

Students usually will enroll in the department of their basic specialty and then select courses in other departments to obtain a broad understanding of the problems of the environment and the application of their specialty to the solution of those problems.

The fellowships provide tuition, fees, a stipend, and dependency allowance.

Additional information is available from the head of the departments mentioned, or the Institute of Environmental Health Studies, Box 630, Chapel Hill, N.C. 27514.

Announcements for publication should be forwarded to Public Health Reports 6 months in advance of the deadline date for application for admission or financial aid, whichever is earlier.

Transfer of the Maternal and Child Health Service to HSMHA

The maternal and child health program of the Children's Bureau has been transferred, as the Maternal and Child Health Service, to the Health Services and Mental Health Administration. The Maternal and Child Health Service administers several grant programs under the Social Security Act, title V.

Formula Grants to States. Maternal and child health services include maternity clinics, family planning services, well-child and pediatric clinics, school health programs, public health nursing, and mental retardation clinics for diagnosis and treatment. Under the State and local programs, 292,000 women received maternity clinic services in fiscal year 1968. About 1.6 million children were seen in well-child conferences. The maternal and child health grants support 160 mental retardation clinics.

The State crippled children's services include casefinding, diagnosis, treatment, and followup. Over 400,000 handicapped children are receiving care in these programs.

Grants for Special Projects in Health Care. Maternity and Infant Care—Grants for these projects were authorized by the 1963 Amendments to the Social Security Act. The projects provide comprehensive health care to high-risk mothers and infants in low-income areas. Social, nutrition, and family planning services are included in the care made available to the mothers. Fifty-three projects are in operation. About 480,000 women have been admitted to the projects for maternity care since the program began in 1964. Grants for these projects may be made to State or local health agencies and other public or nonprofit private agencies or institutions.

School and Preschool Children—Grants for projects providing comprehensive health services to children of school and preschool age in low-income areas were authorized by the 1965 Social Security Amendments. There are now 58 projects operating. Screening, diagnostic, and preventive services are provided to all children enrolled. Treatment, correction of defects, and aftercare services are provided to those who would not otherwise receive them. The projects have registered approximately 362,000 children so far. State or local health departments, State crippled children's agencies, medical schools, and teaching hospitals affiliated with medical schools are eligible for these grants.

Dental Health—Grants for projects providing dental care for children of school and preschool age in low-income areas were authorized by the 1967 Social Security Amendments. State and local health agencies and other nonprofit agencies are eligible for these grants.

Training and Research. Training grants are made to public or nonprofit private institutions of higher learning for training personnel for health care and related services for mothers and children, particularly retarded and multiple handicapped children. During fiscal year 1969, 148 fellowships and 19 short-term traineeships were supported in such health fields as pediatrics, pedodontics, genetics, psychology, nursing, medical social work, speech pathology, and audiology.

The general objective of the research grants program is to help improve the effectiveness of maternal and child health and crippled children's programs. Special emphasis is given to projects to study the need for the feasibility, costs, and effectiveness of comprehensive health care programs in which maximum use is made of health personnel of varying levels of training.

For fiscal year 1969, Congress appropriated $209.2 million for all title V programs, of which $50 million was for maternal and child health services, $57 million for crippled children's services, $48 million for maternity and infant care projects, $39 million for projects for health of school and preschool children, $9 million for training of personnel for health care and services to mothers and children, and $6.2 million for research projects relating to maternal and child health and crippled children's services. No funds were made available for projects for dental health of children.

Federal Publications

Mental Health Considerations in Public Health: A guide for training and practice. *PHS Publication No. 1898; May 1969; edited by Stephen E. Goldston; 252 pages; $1.25.* Contains 12 working papers prepared for the National Conference on Mental Health in Public Health Training, held at Airlie House in Warrenton, Va., May 27–30, 1968. Covers such subjects as general health administration, medical care and hospital administration, health education, epidemiology, biostatistics, chronic diseases, maternal and child health, public health nursing, family planning and population policies, enviromental health, occupational health, and nutrition.

Screening for Bacteriuria. *PHS Publication No. 1875; 1969; 11 pages; 15 cents.* Includes summary statements on the significance of bacteriuria, screening tools, confirmatory tests, and followup of patients based on review of the medical literature and discussion with experts in the field. The document is intended to assist physicians, hospital administrators, and health center directors throughout the country who are proposing to establish screening programs for the detection of bacteriuria in high-risk populations.

Selected Sources of Inexpensive Mental Health Materials. A directory for mental health educators. *PHS Publication No. 1911; 1969; 60 pages; 40 cents.* Prepared by the Mental Health Materials Center under contract with the National Clearinghouse for Mental Health Information, National Institute of Mental Health. The annotated alphabetical list of publishers of mental health materials describes these agencies and organizations and gives details on their publications. Also contains a subject index which lists sources of material available under each category named. Each category gives those organizations or agencies whose primary purpose is work in a field closely related to that of the heading. The organizations listed under "see also" are those which have produced publications and should be considered by conscientious mental health educators.

Proceedings of the National Conference on Mental Health in Public Health Training, May 27–30, 1968. *PHS Publication No. 1899; May 1969; edited and compiled by Stephen E. Goldston; 89 pages; 60 cents.* Includes the reports of the work groups, plenary sessions, and formal presentations of the conference.

State-Interstate Solid Waste Planning Grants and Agencies. Progress abstracts, January 1969. *PHS Publication No. 1913; 1969; compiled by Daniel D. Swavely and Lee F. Hultgren; 94 pages.* Contains a compilation of abstracts developed from reports and other materials in the Solid Wastes Program files to reflect the progress made in solid waste planning, by each State, up to July 1, 1968.

Highlights of Research Progress in Human Development, 1967. *National Institute of Child Health and Human Development. 1969; 11 pages.*

Reports the highlights of research supported by the National Institute of Child Health and Development of the National Institutes of Health. Covers research in population, reproductive biology, perinatal biology, the developing years, physical development, mental retardation, and the process of aging.

Some research highlights from the booklet include:

1. A new preparation, developed by researchers at the Columbia University College of Physicians and Surgeons, could virtually eliminate the incompatibility of blood groups between mother and fetus commonly known as the Rh-factor. When the agent is administered to an Rh-negative mother a few days after she has delivered an unaffected Rh-positive baby, she develops a passive immunity, protecting future children from the dangers of Rh-incompatability.

2. A new method for diagnosing congenital auditory defects in infants will help give children with impaired hearing a better chance to develop normal speech, language, and educational patterns by using computer analysis of electroencephalograph responses to clicks, tones, and light flashes. It has been tested effectively on infants from 1 to 8 months old.

3. Galactosemia, an inborn error of carbohydrate metabolism, can cause growth failure, cirrhosis of the liver, cataracts, and mental retardation. Two new screening processes—one using a methylene-blue linked test and the other a fluorescent spot test—permit large-scale screening of infants for this condition, making it possible to treat these infants promptly with galactose-free diets.

4. The growing number of senior citizens necessitates research into ways they can spend more productive and enjoyable years. Investigators have found that older people can improve their verbal learning capacity by reading aloud while they are learning and by having a chance for active response while in the learning situation.

This section carries announcements of new publications prepared by the Public Health Service and of selected publications prepared with Federal support.

Unless otherwise indicated, publications for which prices are quoted are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Orders should be accompanied by cash, check, or money order and should fully identify the publication. Public Health Service publications which do not carry price quotations, as well as single sample copies of those for which prices are shown, can be obtained without charge from the Public Inquiries Branch, Public Health Service, Washington, D.C. 20201.

The Public Health Service does not supply publications other than its own.

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phr synopses

BIBLE, BOND L. (American Medical Association): *Physicians' views of medical practice in nonmetropolitan communities. Professional and social aspects. Public Health Reports, Vol. 85, January 1970, pp. 11–17.*

A random sample of 2,468 physicians practicing in U.S. nonmetropolitan areas was surveyed in 1967 with a questionnaire entitled "Medical Practice in Small and Large Communities." The responses of 1,853 physicians indicated that smalltown practitioners and their wives had predominantly smalltown backgrounds, and physicians practicing in nonmetropolitan cities of 25,000 or more generally were reared in similarly sized cities.

Factors which influenced physicians to come to their present practice locations are obviously complex. The most frequently mentioned influences were best opening when ready to practice, geographic preference, and family and friends. In finding a location, either hometown preference or suggestion of friends was most often listed, followed by place of internship nearby as well as assistance of State and American Medical Association physicians' placement services.

Among the 1,853 respondents, 58 percent were engaged in solo or individual practice, 17 percent in group medical practice, and 25 percent in various combinations of group medical practice, partnership, and salary arrangements. Access to continuing medical education programs, opportunities for professional growth, hours of practice, medical facilities and personnel available, and emergency medical facilities available were of concern to physicians, particularly those located in isolated rural counties.

Physicians who found rural practice and living appealing did so because the rural people were friendly and dependable, which resulted in close, personal ties; because they enjoyed the recreational advantages of the open country; and because there was less traffic and confusion and a slower pace. There was more dissatisfaction with community life and medical practice in the isolated rural counties than in the more populated nonmetropolitan counties.

CARRINGTON, R. ALLEN (Human Population Laboratory, California Department of Public Health): *Analysis of mobility and change in a longitudinal sample. Public Health Reports, Vol. 85, January 1970, pp. 49–58.*

In a study of change in a longitudinal sample, the Human Population Laboratory of the California Department of Public Health found that 38 percent of a sample of adults had moved during a 3-year interval between contacts. Ninety-two percent of the movers were successfully traced, however, and 78 percent of those contacted responded with only mail and night letter solicitation.

Comparisons of movers with nonmovers revealed significant differences in age, marital status, income, community involvement, and health. The movers were much younger, more often separated or divorced, less often rearing children, with incomes below those of nonmovers. They were less involved in church and civic affairs and while their general health seemed good, fewer had health insurance or a regular physician. Failure to follow the movers would have distorted important panel variables in addition to drastically reducing panel size. The validity of the longitudinal study as a research instrument requires the followup of movers as well as nonmovers.

ROGOT, EUGENE (National Heart Institute, Public Health Service), and BLACKWELDER, WILLIAM C.: *Associations of cardiovascular mortality with weather in Memphis, Tennessee, Public Health Reports, Vol. 85, January 1970, pp. 25–39.*

Daily mortality and weather records for Memphis, Tenn., for 1959–61 were used to study associations of mortality and weather. Specific disease categories of interest were all cardiovascular diseases, arteriosclerotic heart disease, vascular lesions affecting the central nervous system, and respiratory disease. The weather variable found to be most strongly associated with mortality was daily average temperature. Similar inverse relationships with temperature were found for mortality from cardiovascular and arteriosclerotic heart disease, whether or not respiratory disease was present. For arteriosclerotic heart disease, sudden deaths appeared to be more strongly associated with temperature than nonsudden deaths. An inverse relationship with temperature was found for vascular lesions affecting the central nervous system in combination with general arteriosclerosis or with hypertensive disease, but not for vascular lesions alone. For respiratory disease, an inverse association with temperature was found except for an increase in mortality on the hottest days. An investigation of temperature on a given day associated with mortality on a subsequent day appeared no more meaningful than the study of temperature and mortality on the same day.

Direct associations with wind speed and inverse associations with relative humidity were suggested for cardiovascular disease, arteriosclerotic heart disease, and vascular lesions affecting the central nervous system. These relationships could be explained, however, at least in part, by the negative correlation of wind speed with temperature and the positive correlation of relative humidity with temperature. For other weather variables (precipitation, percent of possible sunshine, and barometric pressure), no associations with mortality were detected.

phr synopses

GOCHMAN, DAVID S. (University of Michigan School of Public Health): *Children's perceptions of vulnerability to illness and accidents. An exploratory study. Public Health Reports, Vol. 85, January 1970, pp. 69–73.*

An exploratory study was undertaken in 1967–68 to examine children's perceptions of vulnerability to an illness or accident and the degree of consistency in expectancies of such health-related events.

The responses of 134 youngsters, 10–17 years old, to 10 questions about the likelihood of encountering certain health-related events indicated that perceived vulnerability is consistent across health problems and may be evidence of a personality characteristic. Also, there was a consistent pattern of health-relevant expectancies that was not markedly affected by age or sex. However, some sex differences in levels (not consistency) of expectancy of illness were noted. Implications of these findings for public health workers relate to the content and timing of programs designed to teach desirable health behavior.

GARBER, HOWARD J. (National Communicable Disease Center, Public Health Service), GLICK, THOMAS H., JOSEPH, J. MEHSEN, DUPONT, HERBERT, and EICHLER, STEFAN: *Aseptic meningitis epidemic involving ECHO 4 and Coxsackie B5 viruses. Public Health Reports, Vol. 85, January 1970, pp. 59–65.*

In Baltimore, Md., from July through October 1967, an epidemic of aseptic meningitis occurred in which two enteroviruses, ECHO 4 and Coxsackie B5, were concurrently the dominant agents that were etiologically implicated. A total of 202 cases were reported; the overall attack rate was 22.1 per 100,000 population.

A virus was recovered from 51 patients. The agent was ECHO 4 in 31 cases and Coxsackie B5 in 13 others. Serologic confirmation of infection by the agent isolated—ECHO 4 or Coxsackie B5—was obtained for 87.5 percent of the patients tested. The confirmed cases appeared to be generally representative of the 202 cases reviewed clinically.

MIDURA, THADDEUS (Microbial Diseases Laboratory, California State Department of Public Health), GERBER, MARTIN, WOOD, RONALD, and LEONARD, ALVIN R.: *Outbreak of food poisoning caused by* Bacillus cereus. *Public Health Reports, Vol. 85, January 1970, pp. 45–48.*

An outbreak of gastroenteritis affected 15 college students fed through a common kitchen in a fraternity house at the University of California, Berkeley. The illness was characterized by diarrhea, abdominal pain, and nausea with little vomiting. The average incubation time was 10 hours, the attack rate was 48.3 percent.

Laboratory examination of a meat loaf served at the previous evening meal indicated the presence of 70 x 10^6 *Bacillus cereus* organisms per gram of meat loaf, but the more common agents usually incriminated in bacterial food poisoning were not observed.

A limited study was performed to determine what temperatures a similarly prepared meat loaf would attain during cooking. On the basis of the experimental results, it indicated that the actual cooking temperatures and holding procedures may have stimulated microbial growth.

Documented reports of *B. cereus* food poisoning outbreaks in the United States are scanty. Laboratory investigation of foodborne outbreaks of gastroenteritis should include determinations of the total numbers of bacteria, kinds of bacteria, and the relative numbers of each kind of organism involved. This practice would lead to increased recognition of outbreaks caused by *B. cereus* and give a better concept of this organism's importance among the causes of foodborne diseases in the United States.

BLOOM, BERNARD L. (University of Colorado): *Changing patterns of hospitalization for psychiatric disorders. Public Health Reports, Vol. 85, January 1970, pp. 81–87.*

The rates of first admission for psychiatric disorders of residents of Pueblo, Colo., to both public and private facilities during the period 1959–61 were determined and contrasted with the rates in earlier studies in other communities. The crude total rate of first admission was found to be 2.72 per 1,000 population per year. The admission rate varied, however, by age, sex, diagnosis, and type of facility (public or private). Admission rates climbed rapidly with age regardless of sex or diagnosis. More than 60 percent of all the patients were hospitalized in private facilities. Only 12 percent were diagnosed as functional psychotics. Nearly one-third of the patients had conditions diagnosed as psychoneurotic or psychosomatic disorders; 30 percent had acute or chronic brain syndromes; about one-quarter had personality disorders (primarily alcoholism). The total admission rates for males and females were nearly equal. However, admissions in the psychoneurotic category were twice as common for females as for males, while admissions for personality disorders were four times more common for males than for females. Except for patients over age 65 and those with acute and chronic brain syndromes, the rates of admission to private facilities were higher than to public facilities.

In comparison with earlier studies, the study in Pueblo showed what appears to be a significant trend toward increased use of private facilities, but the trend was not uniform. If the community mental health center program is to succeed, general hospitals with psychiatric facilities will have to establish effective treatment programs for the patients who are now underrepresented there.