SUMMARIES OF SELECTED PAPERS
from the 94th annual meeting
of the
AMERICAN PUBLIC HEALTH ASSOCIATION
and related organizations
held at San Francisco,
October 31—November 4, 1966

1966 APHA CONFERENCE

Implications of recent Federal legislation, projected changes in community health services, and developments in the evaluation and selection of health personnel were the most frequently discussed topics at the 94th annual meeting of the American Public Health Association. These topics were discussed in depth at general and junior general sessions, while specific features were emphasized at a number of the meetings of the 15 APHA sections and the nearly 50 related health organizations meeting concurrently. In all, some 400 papers were presented at the 170 scientific sessions held October 31 through November 4, 1966, in San Francisco.

APHA officials reported a registration of 6,247 for the annual meeting, second largest in the association's history. (The record attendance was at the 1964 meeting in New York City.) The attendance figure, impressive as it is, still represents but a fraction of the public health practitioners who are interested in the many papers presented. Not everyone, of course, could attend the San Francisco meeting. Most who did attend discovered quickly that "concurrent sessions" meant that the papers that they wanted to hear were presented at the same time, in different meetings at opposite ends of the city. For both groups of readers—those who were unable to attend the annual meeting and those who were—*Public Health Reports*, for the 15th consecutive year, provides this special APHA summary.

Obviously, not all papers can be summarized in a report such as this one. In some cases, copies of the texts were not available, the subject could not adequately be covered by a summary, or the author planned full publication of his paper in an early issue of a scientific journal, but mostly it is the overwhelming number of papers that precludes any complete conference report. Approximately 130 papers were selected for summarization in this issue. These were not the only important papers by any means. They were selected to give readers a mere sampling of the APHA bill of fare and a glimpse of the problems concerning public health today. Many of the papers we summarized, as well as a number of those we reluctantly omitted, probably will be published in full. We hope that this issue of *Public Health Reports* will tempt you to read the papers when they are published.

MEDICAL CARE

Regional Medical Programs: First Year in Review

Regional medical programs, established in February 1965 under Public Law 89–239, are designed to extend accessibility of improved methods for diagnosis and treatment of heart disease, cancer, stroke, and related diseases. Dr. Robert Q. Marston, associate director of the National Institutes of Health, Public Health Service, and director of its Division of Regional Medical Programs, and Stephen J. Ackerman, chief of the division's Planning and Evaluation Branch, reviewed these regional programs.

The programs, Marston noted, are based upon a flexible framework of cooperation among all of the health and medical interests of a region, including medical schools, medical centers, practicing physicians, hospitals, and public and private voluntary health agencies. The cooperative efforts undertaken within these regions are being financed by funds allocated to the division for this purpose by the Congress. To an unusual extent, Marston emphasized, the actual scope and definition of the program takes place through the actions of people in the programs themselves, including delineation of their own regions.

Ackerman outlined the development of the regional medical programs from the time the law was enacted. In the early months, he said, our staff was concerned with reassuring various medical and health groups that their prerogatives would not be encroached upon and defining and interpreting the program as it developed. Later, ad hoc review committees and the division's National Advisory Council met virtually month to month to review the initial planning grant applications. To date, 20 such planning applications have been approved and funded, and other applications covering virtually the entire nation are expected to have been received and funded by early 1967. (As of January 1, 1967, the number had increased to 34.)

Major attention in the coming months, the authors said, will include consideration of the first applications for operational grants, continuing education activities, and the Surgeon General's report to Congress on the progress of the programs, required under the law by June 30, 1967.

The authors discussed the major socioeconomic and scientific trends which have influenced modern medical care and resulted in the concept of regional medical programs. They cited a rapidly expanding population, particularly of the aged who require increased medical attention; a steady growth in urbanization and industrialization, resulting in concentration of population; a continuing rise in personal income; and a broadened understanding of health needs. The public, they noted, is now demanding and expecting more in the way of health services than ever before.

In reviewing the impact of the scientific revolution, Marston and Ackerman pointed out that it has created problems concurrently with benefits. Fragmentation of health services, for instance, has often accompanied the increase in specialized knowledge among those who deliver such services. The private physician and other health workers are often unable to keep abreast of the latest technology. Fortunately, Ackerman observed, a trend toward the integration and coordination of health services has developed in response to the difficulties growing out of the scientific revolution. Regional medical programs, he noted, reflect this attempt to overcome fragmentation and to bridge the "learning gap" between practitioners and the sources of knowledge. Their aim, he said, is not only to improve the quality of medical care but also to extend that improved quality to a greater number of people.

Screen Cases by Computer For Utilization Review

Application of advanced statistical and data processing methods to the selection of cases for hospital utilization review was described by Dr. Harvey Wolfe, assistant professor of systems management engineering and operations research, School of Engineering, University of Pittsburgh.

By eliminating cases where external factors account for an unusual length of hospital stay, such techniques, Wolfe said, can save the reviewing physicians considerable time. The probability that a case which comes before the utilization committee will be of some interest is thus greatly enhanced.

All hospitals participating in Medicare are required to operate a utilization review plan for at least those services furnished by the hospital to inpatients entitled to Medicare benefits, Wolfe commented. Currently the methods used, he said, are random selection of cases and selection of cases deviating considerably from the average length of hospital stay. If, however, cases are selected randomly, he pointed out that reviewers spend much time on cases which yield little insight on appropriate hospital use. Selecting those which deviate significantly from the average length of stay for a given diagnosis increases to some extent the percentage of cases for review that are of interest. The major drawback is the relatively large variation about the average length of stay.

In the approach to case selection that Wolfe suggested, regression equations are used to predict an expected length of hospital stay based upon a number of easily accessible factors (sex of patient, number of consultations, and number of diagnoses, for example). Statistical control techniques are applied to choose cases which are most likely to be of interest to the reviewers.

Because computers can be used with this prediction technique, a cursory review can be made of the case of every patient in the hospital on a particular day or during a specific period. An entire month's cases could be screened by computer in just a few minutes, Wolfe declared. This technique would thus permit a more comprehensive appraisal of patterns of utilization in a particular hospital than is currently

possible with other techniques. As a byproduct, said Wolfe, detailed tabulations with respect to length of hospital stay for particular diagnoses could be collected for further study.

Prediction of length of hospital stay in terms of independent variables is not a new technique, Wolfe commented. Application of prediction by regression analysis to hospital utilization reviews represents, however, an interesting extension of this predictive theory, he said. Much further research is indicated, the author cautioned. More diagnoses have to be analyzed in terms of a regression equation, new factors have to be investigated, and—most important—methods of implementation must be devised.

Fee-for-Service Payments To Physicians Preferred

Clients in Baltimore's medical care program for the indigent have made wider use of physician services and of prescriptions since a fee-for-service method of reimbursement of physicians replaced a capitation method of payment. Moreover, stated Dr. C. A. Alexander, Johns Hopkins University School of Hygiene and Public Health, clients complain less, and more physicians are participating in the program.

The decrease in clients' complaints, said the author, is apparently due to the continuing freedom of choice conferred by the fee-for-service plan. No change in the use of clinic services or of inpatient care was observed.

The medical care program for the indigent began in 1948 and operated for nearly 15 years without major changes, according to the author. The physicians were reimbursed on a capitation basis until the fee-for-service method was instituted on January 1, 1963. The level of payment is low under both methods, Alexander noted, cautioning that level of payment may affect the magnitude of the changes in use of medical care and services.

Total costs of the program have increased in the period since the fee-for-service plan has been in operation, the author reported. Most of the increase is due, however, he said, to a larger clientele. The proportion of administrative cost to total cost has declined.

Despite the paperwork and the lower average fee collected by most physicians with a large clientele of program patients, almost all physicians preferred the fee-for-service method of payment. Also, the author pointed out, fee for service insures that a service is supplied by the physician; no mechanism for such ascertainment was available with the capitation method of disbursement.

Do a Physician's Records Reflect Quality of Care?

Can the quality of care a physician provides be determined from a study of the records he keeps? Dr. Isidore Altman, professor of biostatistics, Graduate School of Public Health, University of Pittsburgh, described an attempt to develop a routine for assessing recordkeeping in the offices of internists, plus "a beginning attempt" to measure quality of care as it might be reflected in recordkeeping.

Technically speaking, Altman reported, we ran into problems of operation, such as sampling, but these are mechanical problems which can be solved. More serious, he stated, was our inability to try out more than one process. Moreover, he pointed out, our technique was applied to one kind of specialist in one part of the United States, so that we have to be cautious about any generalizations.

Our study procedure consisted of a series of steps, said Altman, in which we first sent a physician into another physician's office to judge the suitability of the latter's records for abstracting by a suitably trained nonphysician; then we sent in the paramedically trained person. Finally, he said, we experimented with judging quality of care by the content of the physician's record as abstracted.

We considered the previsit by a physician, Altman emphasized, to be a sensible—virtually a necessary step—to save the nonphysician interviewer the responsibility for gaining entry and for deciding about the suitability of the physician's records for abstracting. If the visitor is a physician, the author said, he has an advantage when it comes to establishing the necessary relationships.

As for the assessment of quality of care, Altman expressed the belief that it is "quite a leap" from the quality of recordkeeping to the quality of medical care actually given. Many of us, he commented, have personal physicians whose records, when we look at them across the desk, look rather messy, but we respect, and place considerable faith in, the care we receive from these physicians. In any event, stated the author, our group agreed that good records will almost certainly reflect good care but that poor records do not necessarily reflect poor care.

Altman offered some recommendations. We would like, he said, to see efforts made to get physicians to keep more complete and more legible records. Such efforts should be spearheaded by the physicians' own professional organizations. We need also to reach agreement, he added, on what the form and content of a good record ought to be. For that "most elusive of problems," measuring the quality of care, Altman declared that he could only recommend further study. There are, however, he said, a number of items which physicians tend to record routinely which can form the bases for assessing quality.

Not Getting Money's Worth In Employee Health Plans?

Both management and labor complain that they have become collection and disbursing agencies for hospital and medical services, without any control over the quality or organization of such services, declared B. H. Goodenough, vice president of the Pacific Maritime Association.

Management, he said, is paying out millions of dollars for various welfare programs without, in some instances, realizing a full dollar's value in services, either for management or employees. A multitude of varied health programs result from

the 125,000 separate bargaining contracts negotiated each year in the United States with 68,837 separate local unions affiliated with 181 different national or international unions. Goodenough estimated that more than 68,837 employers are affected by these agreements.

Twenty years of collective bargaining about employee health programs—programs for which management, labor, the medical profession, insurance carriers, and others concerned were unprepared—has brought about a state of dissatisfaction, Goodenough held.

Unions complain, he noted, that new benefits are difficult to negotiate because the higher costs for existing services are charged by management against any package settlement in collective bargaining. Many unions, he charged, have sought exotic and unproved or uneconomic benefits merely to be able to claim that they secured something different or better than some other union obtained.

Yet despite shortcomings and shortsightedness on both sides, these thousands of health programs have enhanced the physical well-being of all people involved in them, Goodenough declared.

As guidelines for the future, the author urged management and labor unions to change their practices at the bargaining table and begin to plan for top medical care, rather than merely providing money for health plans. It will be necessary, he said, for experts in the health field to work with labor and management in the local community in order to develop specific programs. Ways and means must be found to include bona fide medical technicians as advisers.

In the future, after labor and management have negotiated the price or the benefit and left the bargaining table, they must work not as adversaries, said Goodenough, but as partners in research, study, and cooperative ventures to obtain the benefits needed at the lowest cost possible.

If management and labor want to maintain their so-called autonomy or identity in the field of health care, concluded the author, one way to do it is by working together to broaden the base of coverage, to analyze costs, to improve administration, and to approach carriers—be they insurance companies, group practice organizations, or community setups—as a unified force.

Bell System Companies Plan for Medicare

Industry's first obligation when Medicare became law was to design plans for adapting existing medical expense insurance to the conditions created by the new law, said Harold H. Schroeder, assistant vice president of American Telephone and Telegraph Company. Officials of the Bell System companies began this task by comparing Medicare with their existing plans, looking for areas of duplication and areas covered by one plan and not the other.

The Bell System companies, Schroeder said, recognized Medicare as the fundamental insurance program for its people over 65 years of age and did everything possible to have them enroll in Medicare before the enrollment deadline.

Among the objectives the companies set for the new health program for pensioners was that Medicare benefits in combination with benefits from the new company health program would equal the benefits of the old company insurance. In addition, the companies hoped to use Medicare to the full extent and to keep the cost of insurance to pensioners from rising, said Schroeder. The companies also hoped to present the new plans in easily understandable general terms and to create, with the combination of Medicare and the company plan, a program acceptable to the unions.

Fewer Somatic Complaints After Brief Psychotherapy

If patients demonstrating emotional distress are not provided psychotherapy, they often seek relief by "offering" physical symptoms to their nonpsychiatric physicians. The result is that these patients attend medical facilities more frequently than the average patient.

Dr. William T. Follette, chief psychiatrist, and Dr. Nicholas A. Cummings, chief psychologist, Kaiser Foundation Hospital and Permanente Medical Group, San Francisco, reported this conclusion after a study of patients of the Kaiser Foundation Health Plan who were treated at the facilities of the Permanente Medical Group and the Kaiser Hospital. The aim of the study was to discover whether a change in a patient's use of outpatient and inpatient facilities occurs after psychotherapy.

The psychotherapy sample included every fifth new psychiatric patient seen in the psychiatry clinic during the calendar year 1960. Criteria of psychological distress were ascertained by a review of these patients' medical charts. A matched sample having the same criteria of distress was drawn. The use of all outpatient facilities (all services such as medicine, obstetrics-gynecology, surgery, laboratory, X-ray, and so forth) and the number of inpatient days were tabulated for both groups for the year prior to the initial contact in psychiatry and the 5 subsequent years. The patients receiving psychotherapy were divided into three groups according to whether they received one interview only, brief psychotherapy, or long-term psychotherapy.

Psychotherapy patients, said the authors, are initially significantly high users of medical facilities. Patients in the matched sample, however, were also high users, as they were selected to match degree of use as well as other characteristics of the study subjects.

The medical use of all three psychotherapy groups significantly declined after the contact in the psychiatry clinic, Follette and Cummings reported. Moreover, the decline was maintained in the 5 subsequent years studied. Use of medical services by the matched group did not decline.

The brief-psychotherapy group and the one-session-only group demonstrated the largest decline in outpatient use. This decline, the authors pointed out, theoretically helped to offset the cost of providing psychotherapy. The decline in outpatient use by the long-term therapy group was not enough, however, to offset the cost of providing psycho-

therapy. The combined cost of their psychiatric and nonpsychiatric medical treatment, explained the authors, was greater than the cost of their prior medical use alone. Nevertheless, they said, this group demonstrated a considerable decline in days of hospitalization—"a decline which helps to make psychiatric care for this group of patients financially less costly in this setting."

Psychotherapy, concluded the authors, can significantly offset some of the costs of providing that service by savings in other services when all services are provided as part of a comprehensive prepaid medical plan. Psychiatry, therefore, should be considered an important specialty in every comprehensive medical care program, and psychotherapy should be available to patients whose problems are to a large degree emotional in origin.

LAWS AND REGULATIONS

New Approach to Regulation Of Food and Drugs

Dr. George A. McKray, lecturer in public health and administration, University of California School of Public Health, Berkeley, reviewed recent statements of Dr. James L. Goddard, Commissioner of the Food and Drug Administration on two major subjects—the regulation of dietary foods and vitamins and of drug advertising and labeling. After also considering actions taken by the Commissioner and their possible effects, McKray offered some comments on "where we ought to go from here."

Dietary Food Regulations

Regulations presently in effect concerning labeling of dietary foods seek to insure, said McKray, that the consumer is fully informed as to their contents and other dietary properties. The regulations are, however, out of date, since they were published in 1942. Enforcement of them in the courts, said the author, has proved "tedious and expensive" both to the Food and Drug Administration and the consumer. He cited examples of court cases to demonstrate the difficulties and expense now required if the Food and Drug Administration is to prove nutritional claims are false.

Cognizant of the cost of further delay, Goddard announced on June 17, 1966, that revised dietary food regulations would be effective on December 14, 1966, unless stayed for a public hearing on legally justified objections. As expected, the agency thereupon received "an avalanche of objections." [On December 14, revised regulations were published with an order staying them and listing the issues for consideration at a hearing to be announced later. ED.] McKray said that with such further revisions "as hearings show to be desirable the new regulations should be put into effect as an important step forward in the area of consumer well-being." Effective implementation, he declared, could bring about "a three-way partnership of the consumer, legitimate food and drug industries, and the United States Government."

As nutrition becomes a more technical science, said McKray, it is increasingly able to supply concrete standards by which products and their labels can be objectively judged. Regulations stating specific standards have the advantage of clarity, necessitating the minimum of interpretations of a statute. They can result in increased health education of the consumer, greater possibility for self-regulation by the food and drug industry, and simplified enforcement by Government.

Drug Advertising and Labeling

The 1962 drug amendments to the Federal Food, Drug, and Cosmetic Act of 1938 gave the Food and Drug Administration the responsibility for policing prescription drug advertising, which, along with the labeling, must honestly indicate a drug's weaknesses as well as strengths. Drug labeling and advertising, McKray pointed out, must contain information which will provide physicians and patients with necessary knowledge about a drug and not mislead them as to its nature. The Food and Drug Administration is empowered to make seizures, seek court injunctions, or prefer criminal charges against persons and firms that fail to meet these requirements. McKray cited examples of how the Administration has been using this power under Goddard. He described some of the instances of FDA seizures of products and discussed criminal proceedings that the Administration has initiated on account of mislabeling and false or inaccurate advertising of pharmaceutical products. Stern measures are being taken, McKray pointed out, against major drug firms who advertise their prescription products to physicians in the scores of professional publications and by direct mail brochures.

"Taking up where Goddard left off, it is my contention," said McKray, "that the next step toward fuller consumer protection is a review of the liability of physicians in prescribing drugs." The manufacturers' brochures, McKray held, provide a means of establishing improved criteria by which negligence of physicians in using prescription drugs can be judged. Right now, he said, the tactical effect of introducing drug manufacturers' brochures is highly significant in the actual trial of malpractice cases. The plaintiff, if he is injured from an improper administration of a drug or reaction therefrom, may introduce into evidence the printed instructions by the drug's manufacturer to determine whether or not the physician administered the drug in proper dosage and form. Any deviation from the printed instruction in the brochure may well require justification by the defendant physician for his failure to comply with these instructions.

A physician prescribing a drug and deviating from the manufacturer's brochure might justify his actions by demonstrating that his method was practiced or recognized by his colleagues. In this age of mobility and mass communication, however, remarked McKray, the use of the local medical community as the final word in judging a suitable medical tech-

nique seems to be anachronistic. "In my estimation," he said, "the best of the possible legal standards presently available is the official FDA-approved brochure of the manufacturer." This approved brochure should logically carry more weight in court than did the manufacturer's other literature created with advertising in mind, McKray said.

Toughness in requiring pharmaceutical companies to toe the line will not pay off in optimum protection for the patient, declared the author, until the prescribing physician is bound by a legal duty of care to comply with the official FDA brochure. "To the charge," said McKray, "that such legal restrictions on the doctor hamper his creativeness, I answer that he should experiment only with proper safeguards and where the patient has been informed that he is being used as a guinea pig."

Medicare Offers Chance For Innovations

With Medicare we had an opportunity to define national standards for four different kinds of providers of services, commented Dr. John W. Cashman, chief of the Division of Medical Care Administration, Public Health Service. We also had an opportunity, he said, to break new ground with at least three of these.

Having defined the upper and lower limits for facilities participating in Medicare, Congress left most of the remaining decisions to the Secretary of Health, Education, and Welfare, Cashman observed. There was no accreditation floor or ceiling with respect to developing standards for home health agencies, extended care facilities, or independent laboratories, he pointed out, and very little in the way of licensing or accreditation standards to serve as guidelines.

People tend to resist innovation introduced by governmental programs, said the author. And the Medicare requirements represented entirely new concepts to the individual provider of services in the vast majority of cases. We have trodden lightly, therefore, he stated, in defining and applying the standards. He gave some examples of flexibility in their definition and application.

The problem of setting standards for home health agencies was compounded by the fact that few were in existence. We had to set standards initially, said Cashman, at a level to encourage the organization and participation of newly formed, relatively small agencies and at the same time encourage the rare, hospital-based or community-based comprehensive home care program. We accept the fact that the standards are minimal, but we are not complacent about it, he said.

In coining the term, extended care facility, Congress conceived of an entirely new kind of institution, Cashman stated. The conditions for participation of such facilities in Medicare emphasize qualified nursing services and organization. Yet, on the basis of the requirement for qualified nurses alone, the author pointed out, some 60 percent of the institutions currently called nursing homes will probably be unable to qualify for participation. This fact suggests, the author stated, that there is a need for developing, through licensure, accreditation, or medical assistance programs, adequate standards for facilities providing less intensive care than is required in extended care facilities.

Medicare standards for independent laboratories rely heavily, noted Cashman, on educational and experience qualifications of the laboratory staff. They require that if the laboratory director has less than an appropriate doctoral degree, the laboratory must show evidence of successful participation in a proficiency testing program. We are exploring the possibility, he reported, of a project to ascertain the effectiveness of proficiency testing in maintaining quality of laboratory performance, irrespective of personnel qualifications.

To allow time for facilities to correct deficiencies, Cashman pointed out, we have applied the concept of substantial compliance. Under it, hospitals and other providers of service can be certified for participation even though they have significant deficiencies with respect to one or more standards. If the provider does not make adequate efforts to correct the deficiencies, certification would be withdrawn. A special certification category also has been introduced, said Cashman, to permit certification for a limited period in special circumstances. The States have varied widely in their use of the special certification provision, he commented. More than 2,000 hospitals now participating in Medicare, however, have significant deficiencies with respect to one or more conditions of participation.

Medicare requirements, Cashman concluded, offer a tremendous potential for improving continuity of patient care at the community level. If the Joint Commission for Accreditation of Hospitals eventually becomes the principal accreditation organization for all kinds of medical care services and facilities, would they consider, he wondered, a community medical care accreditation. Cashman conceded that we are probably not yet at the stage where this approach would be acceptable for a program such as Medicare and that we will have to continue "our fragmented approach to standards."

Community Mental Health Seen as Adjunct to Law

Community mental health is allied to crime prevention, opined Arthur R. Matthews, Jr., project director, American Bar Foundation, Chicago. The criminal courts and mental hospitals currently deal with the consequences of mental illness. They do not alleviate the economic, emotional, or intellectual poverty which may precipitate it.

The means to determine a person's mental competence to stand trial is available in every kind of legal case, he declared. It is relatively easy to use and provides expert, inexpensive diagnosis. The legal ramifications of ascertaining mental competence are sufficiently ambiguous to be used by persons with opposing motives, and they are flexible enough to permit broad discretion in their application. These complicated, yet flexible procedures have become the dominant force in dealing with persons whom officials administering criminal law perceive as mentally disabled.

Increased informal disposition of cases within the framework of traditional procedures for determining mental competence has focused attention on the lack of mental health services for persons accused of criminal behavior, Matthews observed. The need for mental health resources, rather than the supposed rigidity of criminal law or the inhibitions of the official participants, precludes the use of these services.

The author related the story of a judge who had committed an offender to a facility for 90 days of intensive psychiatric study. As in most such situations, outpatient psychiatric treatment was recommended. Now the judge has stopped referring cases to this facility because he is frustrated by the dearth of outpatient psychiatric care for offenders in his area.

Everywhere efforts such as the judge's are thwarted by limited mental health resources and inefficient use of existing services, Matthews continued; thus, official awareness of the mental health problems of persons accused or convicted of criminal acts exceeds the ability or willingness of society to provide facilities adequate to the need as discerned by officials of the criminal law.

Administration of criminal law is hampered by overemphasis on diagnosis of mental illness and underemphasis on treatment, Matthews stated. In one clinic, the ratio of diagnostic to treatment interviews approached 100 to 1. If, said the author, one daily observes the persons who crowd our criminal courts—especially those charged with lesser offenses—and compares them with the population of our mental hospitals, he is impressed by their similarities, not their differences.

Success in community health, Matthews concluded, will require the legal and medical professions to join the general public in changing our social institutions in accordance with evolving concepts of mental illness and criminal behavior.

AIR POLLUTION

Showing Effects on Health Of Air Pollutants

A detectable association between the level of certain air pollutants and the prevalence of some symptoms in people was discovered in a recent 3-year study by Dr. Isabel M. Mountain and associates, Cornell University Medical College, New York City.

People in lower- and middle-income urban communities of New York City's lower east side, living within a 2,000-foot radius of an air-monitoring station, were interviewed weekly. With few exceptions, said the authors, the people were unaware that the study had any connection with air pollution. A structured questionnaire with precoded questions was used in the interviews.

In the statistical analysis of the completed questionnaires, the frequency distribution of the total days on which participants gave definite answers about a given symptom was first described. Each day a person answered he contributed a person-day. Thus, for example, in regard to the association of particulate matter and the common cold in adults, a total of 225,907 person-days were available.

We wanted, said the authors, to tally those person-days according to the concentration of particulate matter on each day of observation or, in other words, to construct the frequency distribution of these person-days by level of pollutant (in COH units). What would have been a staggering job, if done manually, said Mountain and her associates, was done ultimately, if not easily, by computer.

Having determined how the total person-days under consideration fell, the question was raised as to whether the days on which the common cold was reported were distributed in the same way randomly among the person-days. If the prevalence of colds was constant, the number of common cold-days would be distributed in the same pattern as the person-days. Taking all the common cold-days and distributing them in this way, the authors pointed out, we would get the expected number of common cold-days if there were no association with the level of particulate matter.

The most significant association, said the authors, both in children and adults, occurred with the pollutants sulfur dioxide, particulate matter, and carbon monoxide, and with the symptoms, cough and common cold. As for eye irritation, a somewhat greater effect was observed in adults than in children. Not all pollutants were incriminated. No association of hydrocarbons with any symptom was found. No pollutant was associated with headache in either age group.

We do not claim, the authors pointed out, that any one of the pollutants is the cause of the symptoms under examination, nor that any one pollutant is operating alone. At present, stated Mountain and her associates, our problem is to identify a demonstrable effect on health, then proceed to focus on the combination of circumstances most highly related to the effect observed.

Exposure to CO Impairs Temporal Judgment

In an effort to determine the subtle behavioral changes attributable to carbon monoxide (CO) 18 young adults were tested for ability to discriminate short intervals of time while exposed to CO, reported Dr. Rodney R. Beard and Dr. George Wertheim, both of the department of preventive medicine, Stanford University School of Medicine. Each subject was observed in at least 15 sessions at which CO was administered in concentrations of 0, 50, 100, 175, and 250 ppm.

Although no changes in overt behavior were seen, a dose-related reduction of correct judgments of time intervals was clearly demonstrated, said Beard and Wertheim. Significant decrements of response were observed for 2½ hours of exposure to all concentrations from 50 ppm upward. Furthermore, deterioration of performance was observed

after only 90 minutes at 50 ppm and 50 minutes at 100 ppm; there was consistent dose relationship at higher levels up to 250 ppm.

Beard and Wertheim reported that experiments performed with operant behavior techniques on rats showed that rats displayed an early disruption of the ability to judge time. Although these animals can learn, with a high degree of reliability, to refrain from pressing a lever for a predetermined time to receive reinforcement, their temporal discrimination was deranged after only 11 minutes of exposure to CO at 100 ppm. Increasing concentrations produced proportionally greater effects.

From these studies, Beard and Wertheim concluded that methods derived from behavioral psychology can contribute materially to the evaluation and understanding of the subtle effects of CO as an air pollutant and can help to formulate standards of air quality.

DENTAL HEALTH

Topical Fluoride Agents Deserve More Study

Further comparisons of topical fluoride agents should be carried out under standardized conditions by other independent investigators before any definite conclusions regarding their relative merits are reached. So concluded a group of researchers headed by Dr. Hugh M. Averill, director of dental health, Eastman Dental Center, Rochester, N.Y. They conducted a 2-year study to compare the caries-preventive effect of 2 percent aqueous sodium fluoride, 4 percent stannous fluoride, and 2 percent acidulated, phosphate-buffered sodium fluoride (pH 4.43).

Approximately 600 children, 7 to 11 years old, representing a wide range of economic levels, were selected from two school systems in areas where communal water supplies contained only a trace of fluoride. We chose this age group, the investigators explained, because these pupils were more likely to have a greater number of newly erupted permanent teeth. Older children are more likely to have restored or missing teeth.

The children were assigned to three groups, and a matched fourth group served as controls. The method for applying the agents, including the placebo solution, was equal to the most careful procedure used in private dental offices. Every child was given a thorough prophylaxis before each semiannual application.

Although the group given 2 percent sodium fluoride showed consistently greater reductions in DMF and DF tooth and surface increments, the overall differences in caries reduction failed to demonstrate conclusively the superiority of any of the agents. Greater protection was afforded teeth which erupted during the study; caries reductions of 43 percent in the newly erupted teeth were observed in children who were treated with aqueous sodium fluoride.

Needy Missouri Children Use Mobile Dental Units

Community action program corporations can provide dental care for needy children, declared Dr. James R. Robinson, dental consultant, Missouri Division of Health.

At the county level, he explained, volunteers are trained in dental health education, casefinding, and followup by the project health educator, the division health educator, and the supervisory public health nurse. In each county, one stop of the mobile unit is arranged, usually at a large school where the project health educator and volunteers hold dental health educational meetings with the populace.

The five mobile units are 8- by 24-foot, specially designed aluminum trailers, made according to Government Service Administration specifications, Robinson said. In addition to being carpeted throughout, they have a reception room, darkroom, ample closets and storage space, two air-conditioners, and four heaters. The armamentarium includes two children's chairs set approximately head to head, two console operating units, an X-ray unit, and two sets of operating and surgical instruments.

The staff consists of a dentist, dental assistant, and the health educator attached to each unit. There is also a repairman to service the dental equipment and move the trailers with a specially equipped 1-ton pickup truck. Volunteers staff the reception room of the unit.

Children 6–8 years of age, Robinson continued, are selected in accordance with the standard financial eligibility formula set down by Federal Agencies and given initial and tentative appointments which depend on arrival time of the mobile unit. Dental health committees and volunteers then make definite original appointments for the children and see that they are kept. Transporting the children to the unit is a local committee responsibility.

Each child is given a clinical examination, bite-wing X-rays, stannous fluoride prophylaxis, and topical applications. If the patient load will permit, all children are given additional appointments. If the patient load is too great, Robinson said, the children are further screened and accepted according to dental and economic needs. The dental priority is decided by the unit dentist, and the economic priority is determined by the county dental health committee or corporation board of directors. The need to serve more than 90 counties with five mobile units demands that a maximum patient load be established.

Services offered include examinations, prophylaxis, topical preventive applications, preventive procedures, removal of infected teeth, and insertion of spacers. With the approval and guidance of the State dental association, the author concluded, this program remains a local project and fills a need in dentistry's responsibility to serve the people.

Good Dental Care To Be Defined Statistically

Dentistry is a dynamic field, and because new knowledge and techniques are being developed continually for the profession's use, the

standard of good care must be revised and updated periodically, observed Dr. H. K. Schonfeld, senior research associate in public health, Yale University. He delivered a paper which he had prepared with several colleagues as part of a project concerned with standards for good health care.

Our study, Schonfeld explained, was undertaken to provide data that would be useful in describing the content of good dental care and in developing standards and indexes to be used in the clinical audit of dental practices. We try to ascertain which dental services should be provided, the sequence in which they should be given, how often, by whom, from whom, and where. Also considered are the number of visits needed, the time spent on these visits, the factors that interfere with the provision and receipt of dental care, and the health consequences of not receiving needed services.

As a first step, the researchers selected a panel of seven practicing dentists with faculty appointments in the Yale University School of Medicine and posts in the department of dentistry of the Yale-New Haven Hospital. These dentists are being interviewed about what should be done to prevent, diagnose, and treat dental disorders.

Information obtained through the interviews is being converted to indexes. Indexes, Shonfeld continued, are being developed on the criteria of care for patients with dental caries; malocclusions; problems in periodontics, oral surgery, prosthodontics, and endodontics; oral manifestations of systemic disease; and other dental conditions.

The indexes should be useful for clinical audit, comparisons of services provided under various organizational arrangements, educational purposes, and estimates of dental manpower needs, Schonfeld said.

Availability of standards and indexes for the clinical audit of dental practice should contribute to better dental health by stimulating and continuing review and evaluation of current practices.

SCHOOL HEALTH

Hearing Tests Given in Mobile Unit

A 1961 survey by the Kansas State Department of Health revealed that approximately 200,000 of the 520,000 school children enrolled yearly in the State had never been given a hearing evaluation, reported Dr. Evalyn S. Gendel, assistant director of the health department's division of maternal and child health. Most audiometric screening, she said, had been concentrated in the metropolitan school systems and the programs were either of the referral type or routine testing of children in the lower grades. The untested children were scattered in 100 of the State's 105 counties.

On the recommendations of the Hearing Conservation Committee of the Kansas Medical Society, a mobile hearing testing unit, which is manned by two audiologists and a public health nurse, was constructed. The Division of Chronic Diseases, Public Health Service, is funding the project with a 5-year neurological and sensory disease project grant. From September of 1964 to June of 1966, 35,435 children in 24 counties of the State have received a hearing screening test in this unit, reported Gendel.

Of the group screened, 1,404 children were referred for medical followup. Gendel stated that forms were returned for 997 of these children. No diagnosis was given for 73 children, while 55 were diagnosed as normal. Conductive hearing loss was found in 485 children, sensorineural loss in 349, and mixed loss in 35.

A consultant physician from the health department met with physicians prior to the program and outlined its procedures, and all children who failed the screening test were referred to their family physicians. This coordination with the medical community has resulted in excellent followup on children identified with hearing loss. Diagnostic clinics are offered 1 month after each screening program, and children can be referred to them by family physicians for further medical workup by an otolaryngologist.

Family Health Records Should Be Kept

Personal and family health records are a necessity that most people keep either inadequately or not at all, said Dr. Donald A. Dukelow, assistant director of the American Medical Association's department of health education. These records, which should be started during a child's infancy and continued throughout his life, should be a history of immunizations, illnesses, and injuries.

The record, said Dukelow, should be brief but readable, including only significant data. It should be expandable and designed to fit the anticipated storage space. Finally, he said, the record should be readily accessible.

Child Health Care Covers Speech and Hearing

Approximately 6 to 10 percent of this nation's school children have hearing or speech disorders which interfere with their communication efforts and probably cause feelings of maladjustment, according to Vera M. Gee, speech and hearing consultant with the Utah State Department of Health, Salt Lake City. Such disorders in communication, cutting a child from learning processes and social interaction with his peers, have been shown to be more difficult for a child to adjust to than a severe physical disorder, she said.

Addressing the question of whether speech and hearing disorders programs belong in the health departments or in the schools, Gee maintained that many speech and hearing problems are a part of a larger health problem and treating them in isolation may do more harm than good. In addition, many communication problems require professional attention before the child comes of school age, as the basic ingredients of normal language development are laid down very early in his life.

Gee said that the goals of her agency have, accordingly, been to

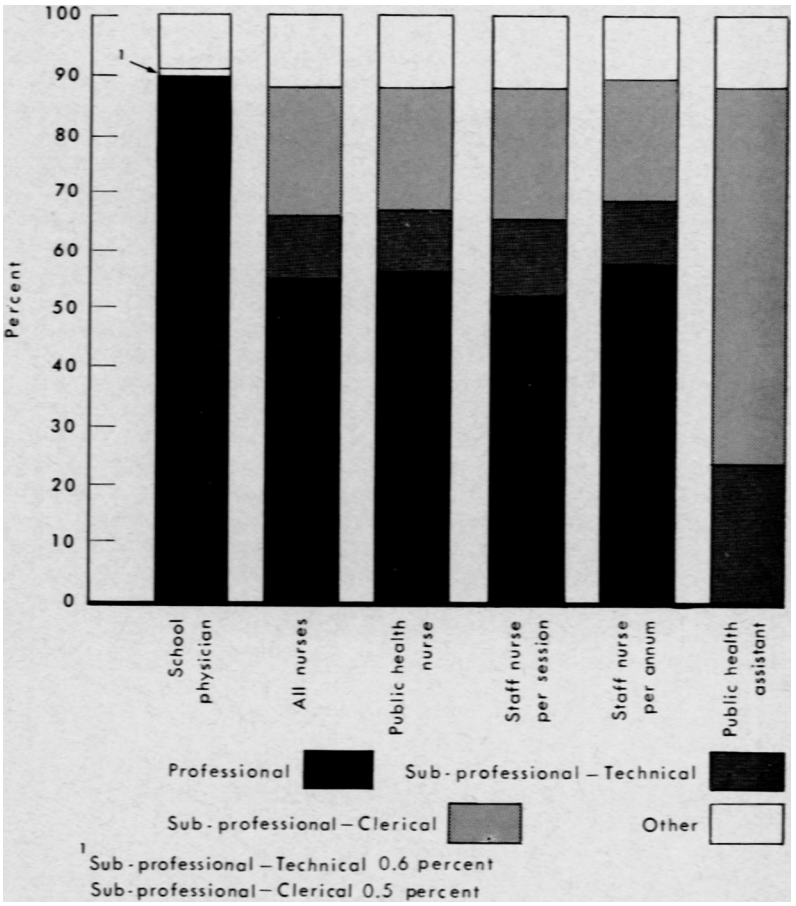
educate civic leaders to the need for speech and hearing therapy services, establish lines of communication between local physicians and public health nurses in the department of health, provide interim professional assistance by conducting demonstration evaluative clinics in communities throughout the State, arrange conferences with educators and parents concerning their role in language habilitation, and provide opportunities for severely involved children to receive intensive therapy at special clinics. The desired outcome of these activities, said Gee, is the establishment of a local program of speech and hearing therapy, operated through the school system and financed by tax funds.

Team Nursing Experiment Instituted in Schools

A detailed study of the use of nursing personnel has been carried out by the Medical and Health Research Association of New York in cooperation with the City Department of Health, reported Lester J. Rosner, administrative assistant commissioner of the New York City Department of Health. The focus was on the school health program because it used more than half of all professional nursing time in the health department (509,399 hours or 54.3 percent of the total in 1964). In addition, the program used only 29 percent of the subprofessional public health assistants' time.

The study was carried out with work diaries in which physicians, nurses, and public health assistants kept chronological records or activity logs on their days in the school health room, said Rosner. Analysis of those records, he stated, revealed that professional nurses spent more than a third of their time on work that could be done by nonprofessional personnel. Furthermore, public health nurses and staff nurses were spending their time in essentially the same way (see chart).

Percent of time spent in all functional levels by title of personnel, New York City, 1964



The Team Approach

When the findings were completely analyzed, a demonstration was planned to reconstruct the school health team so that a public health nurse who would carry a carefully selected caseload would be the leader, serve as a community nurse in the team's geographic area, and advise other team members on the public health nursing approach to their caseloads, reported Grace M. McFadden, Margaret J. O'Brien, and Lorraine Mustoe, public health nurses with the department of health.

A case-oriented approach was decided on, and a record audit to establish the followup needs of each child and plan case assignments for team members was performed. The student body was divided into three categories, said the nurses. Category 1 included children with no apparent health or social problems who were to be under the supervision of the doctor and public health assistant; category 2, children with health or social problems present or suspected, who were to be under the supervision of the staff nurse; and category 3, children with severe health or social problems, who were to be supervised by the public health nurse and the doctor as needed.

McFadden and associates reported that the board of education began orientation of the school personnel as a result of discussions between members of the bureau of school health and the board of education. Supervising nurses continued it at the local level. More intensive orientation was required for the public health nurses and the public health assistants, they said, as the new roles of both required a whole new performance level. The assistants, for example, were being asked to carry a separate caseload of their own and had to be given a great deal of supervising guidance and motivation for the first few months.

Evaluation

Based on preliminary findings, from the point of view of the school health program the experiment has been a success, Dr. Robert W. Culbert and Dr. Olive E. Pitkin of the bureau of school health tentatively concluded. The nature of the team structure and the assignment of duties to various team members assures the utilization of each member at his highest level, and they feel this has been done without sacrificing either the quantity or quality of work done.

Headstart Health Workers Face Planning Problems

One day last spring a group of Headstart children, dressed in their best clothes and accompanied by their parents, happily went to a large clinic for physical examinations. That promising day, reported Dr. Orvis A. Harrelson, director of health services of the Tacoma, Wash., public schools, ended with crying children, angry doctors, rude nurses, upset parents, and a frustrated Headstart staff interacting to change the happiness into chaos.

The problems for the medical staff of Headstart had begun long before this incident, said Harrelson. Administrators of Headstart, who thought it a fine idea for health services to participate, gave such low priority in their planning to an adequate nursing staff that such a staff was not even included in the first budget. School physicians, too, were either excluded or included too late to plan adequately. However, reported Harrelson, nurses from another program worked double duty the first summer of Headstart and were so successful that health services and education are no longer in a low-priority position.

Once health services were included, the medical staff had to decide if examinations should be done by health department well baby clinics, physicians paid a set fee per child, physicians using their own offices and paid their regular fees, or school clinics developed and staffed for this purpose. It seemed to them, said Harrelson, that children would be happier returning to a known physician or clinic, and that parents would be more likely to continue care if the source were financially realistic for their immediate future. Therefore, present family health care contacts were reinforced and families without contacts were helped to establish them.

Once the basis for the program was established, Harrelson said, assistance was solicited from professional organizations. The medical society, and the pediatricians in particular, were pleased with Headstart and approved the plan for obtaining examinations. The dental society overcame mild opposition by conservative members to strongly support the program and local dental clinics cooperated at once. The health department promised to immunize all children not immunized by the examining physicians and to set up neighborhood well baby clinics for families not receiving private or agency care. Even out of the fiasco with the clinic came a plan for more leisurely examinations with adequate parent counseling, reported Harrelson.

Headstart Health Staff Develops Followup Program

The health services staff of Project Headstart in Philadelphia planned to extend the same type of program as is required by the Pennsylvania School Health Acts, reported Dr. Marie E. Currie-Frey, director of the division of medical services of the School District of Philadelphia. Comprehensive health appraisals, screening tests, followup for correction of defects, and maintenance of a comprehensive health record including the school nurse's record were to be included.

In the 1966 summer program, the staff was able to draw on experience from the crash program of the previous summer to evaluate personnel and supply needs and carry out an intensive followup program, said Currie-Frey. School nurses, physicians, and dental personnel from regular school health programs were recruited. Dental teams consisting of a dentist and a dental hygienist were employed, as was a laboratory technician who evaluated abnormal urine and blood specimens found in the screenings.

Although the health program was frequently interrupted by other Headstart activities such as meals and cultural and enrichment programs, Currie-Frey said that the program accomplished health education and counseling among pupils and their families, established permanent health records for each child, and prepared each child for entrance into first grade in good physical health.

Utah Evaluates Pupils In Special Education

Data from a comprehensive multidisciplinary evaluation of children in special education classes in Utah reveal that 31.4 percent of the children placed in special education were not mentally retarded but performed poorly because of medical or psychosocial problems. Children with emotional difficulties, hearing loss, and vision loss made up 26.1 percent (69 children) of this group, reported Dr. Joseph P. Kesler, director of the division of children's services, Utah State Department of Health. In addition, 83 children of the total 264 in special education had medical conditions severe enough to interfere with progress in school; only 16 children had mental retardation without other problems serious enough to interfere with progress.

The evaluation team felt that had these medical defects been recognized and corrected before the children entered school, much of their "mental retardation" would have been prevented, Kesler reported. However, he added, an evaluation with correct diagnosis when a child is failing in school is of considerable value. In the opinion of a teacher in special education, a child's IQ can go up to the extent of 10 points if his teacher develops a plan acceptable to the child considering his physical and mental limitations. The teacher felt that counseling and services to a child who is failing in school should, consequently, be based on a complete evaluation, not just a psychological one.

Kesler said that the population in special education was made up of a disproportionally high percentage of

children from minority racial groups, economically depressed areas, and large families. Apparently the parents of these children could not or did not use the medical care resources available, possibly because such facilities are more geared to middle-and upper-class culture.

NURSING

Insurance Coverage Poor For Aged Chronically Ill

To evaluate the expenditure of chronic illness and aging funds in home nursing, a study of services in a representative group of agencies was designed in 1965 by the Bureau of Chronic Diseases, California State Department of Public Health, reported Sarah Gilchrist, nursing consultant of the bureau. Questionnaires were completed by 35 nursing agencies (10 health departments and 25 visiting nurse agencies) on each patient admitted to service and again at the time of discharge from service.

Nursing services were categorized as (*a*) physical care including grooming and personal hygiene, (*b*) treatments including injections, dressings, and irrigations, (*c*) nutrition including therapeutic diets and diet content, and (*d*) self-care activities, including activities of daily living and graduated activity.

The total number of patients admitted to the 6-month study was 7,677. Their median age was 72 years, Gilchrist reported. Of the 7,677, nurses from the 10 health departments visited 971, and the 25 visiting nurse agencies visited 6,706. A total of 74,746 visits were made, or an average of 10 visits per patient. The health departments averaged one less visit per patient than the visiting nurse agencies. Only one visit was required for 22 percent of admissions. The 10 leading conditions for which patients received care were cardiovascular diseases, cancer, cerebrovascular accidents, postoperative and diabetic conditions, fractures, neurosensory and arthritic conditions, respiratory conditions, and constipation.

About 18 percent of the patients were referred to the home care agencies from a hospital, Gilchrist said. The visiting nurses found that only 32 percent of these hospital-referred patients were covered by health insurance. It has been estimated that about 80 percent of the total population in California is covered by health insurance. Since older persons are less likely to have health insurance, she observed, the bias of the group is partially reflected by this measurement.

Gilchrist observed that since the median age of these patients is 72 years, the majority now are eligible for Medicare benefits.

The Impact of Medicare In Three Areas

Massachusetts

The Medicare program—as well as the crippled children's services, medical assistance, and vocal rehabilitation—requires improved home health services, and the interrelation between these services and the hospital and extended care facilities, all under the direction of the patient's attending physician, will affect other segments of the population besides the elderly, asserted Leon Sternfeld, deputy commissioner and director of local services, and associates in the Massachusetts Department of Public Health, Boston. As more physicians become familiar with the services of home health agencies for their elderly patients, they will be encouraged to use these services for other patients. A general upgrading of care outside of institutions, as well as in the hospitals and nursing homes, is likely to occur in our communities, they continued. Comprehensive health and medical care services of uniformly high quality become possible of attainment within our generation for all persons, they asserted.

The health administrators said that the strengthening of many voluntary home health agencies appears to be counter to the general trend toward shifting voluntary health agency functions to the official health agencies and that care must be taken so that the overall public health nursing functions in the community health program are not distorted. They recommend, if some of the voluntary nursing agencies tend to decrease or discontinue their services to the prenatal patient, that this service be picked up and continued by another community nursing agency, if one is present, or that other suitable arrangements be made. It is here, particularly, that experienced and knowledgeable local public health administrators can exert an important and significant influence, Sternfeld and co-workers maintained.

Many smaller agencies now providing services may merge into fewer and larger agencies to achieve more efficient use of limited resources and provide a higher quality of service, they said. It may even be that combinations of types of agencies may occur with a more widespread generalization of community nursing services. It is difficult to conceive, they remarked, that nursing agencies in public schools can long remain unaffected by the changes, and they think that citizens are justified in questioning the advisability of using a highly qualified public health nurse each day of the school year for the public school population when the health needs requiring public health nursing of many other children and adults in the population are not being fully met.

The Federal legislation in health and related fields has stimulated in a remarkably short period of time a process of profound changes in the home health care agencies, Sternfeld and associates remarked. This, they said, is bound to result in a distinct improvement in health and medical care services for many more persons and families in our communities. Not the least of the effects, they maintained, is the involvement of every State health department in the United States in at least one medical care program.

Hawaii

Medicare opened the doors to statewide home care services in Hawaii for the first time on July 1, 1966. With an estimated 24,200 citizens

eligible for home health services on Oahu, an astronomical increase in requests might have been anticipated, stated Sister Maureen, administrator, Francis Hospital, Honolulu. Realistically, the impact on our program since July 1, 1966, has not reached such proportions, she said. The percentage of patients eligible for Medicare on the hospital-based program increased from 51 percent in June to 67.6 percent in October.

On outer islands there are 11,800 citizens 65 years old and over, Sister Maureen reported. The initial caseload of home care patients is made up totally of patients covered by Medicare, but only one island shows this activity presently, she explained. It is difficult to pinpoint reasons for this, she said, but perhaps plantations are still providing care for their employees and families.

Denver

Most home health agencies seemed to be concerned with one of two questions before July 1, 1966, said Margaret D. Lewis, R.N., Denver Visiting Nurse Service. One, how will we cope with a greatly accelerated demand for service; and two, how can we promote the use of home health services? We were not overly concerned about either, she continued, because we had devoted much time and effort over the past years to encouraging the use of home care services. Denver has public health nurse coordinators in every general hospital, and the Visiting Nurse Association has worked actively to promote the concept of continuity of care from hospital to home, Lewis asserted. As a result of this effort, she said, physicians and the public have been oriented to the fact that our service is for all income levels and is available for outpatients as well as posthospitalized patients.

We did not anticipate a sudden increase in demand for home care services, Lewis stated. We had approximately 450 patients admitted to the program who were on our current caseload as of July 1. After 2 months of Medicare, our caseload is approximately 500. Only three more referrals for the group age 65 and over were received in July than in June. The biggest impact of Medicare for our agency, she said, as far as caseload is concerned, is a positive one. We have a far more stable financial base for providing service to patients in the 65 and over age group.

Study of VNA Referrals Shows Quick Followup

A study of 150 patients who had been discharged from a chronic illness hospital and randomly assigned to receive care from the Visiting Nurse Association in Cleveland was reported by Dr. Mary Adams, assistant professor at Frances Payne Bolton School of Nursing, Western Reserve University, and associates.

The findings are limited to the first 6 months of a 2-year controlled experiment with a sample population of 308 patients 50 years and older. With imperative concern for expansion of the public health nursing service to aged and chronically ill patients, these findings hold implications for program planning, Adams and co-workers stated. They indicate how long a specific patient population remains available for care and the frequency of public health nursing visits to be expected.

In the experimental group of 150 patients receiving home visits, 2 out of 3 were women, three-fifths were 70 years of age or over, and all were afflicted with long-term disabilities such as stroke and hip fractures. All received at least one home visit, the investigators reported. At 6 months, 115, or 77 percent, still received care.

While under care, each patient averaged 3.5 monthly visits during the 6-month period. The 15 patients who died and the 7 who were placed in nursing homes had the highest average number of visits per month (4.7). After an average of 2.7 months, 13 patients had refused further care; they had received 3.4 visits a month from the visiting nurses. For the 115 active cases, the mean number of days between visits was 13.9 over the 6-month interval.

Two-thirds of the 150 patients were seen within 5 days of hospital discharge, the researchers reported, and all but 6 were seen within 2 weeks. The reasons for the 2-week delay included family resistance and rehospitalization, they said.

RADIOLOGICAL HEALTH

Nuclear-Powered Devices In Space Vehicles

Although worldwide fallout can occur from the space program, the executive director of the Federal Radiation Council, Dr. Paul C. Tompkins, anticipates that increasing sophistication and competence in space technology will reduce the probability of large-scale contamination almost to the vanishing point.

The use of nuclear fuels to supply power in space vehicles has, in at least one instance, resulted in worldwide fallout, Tompkins reported. However, pointing out safety criteria, he said that under the most adverse conditions nuclear-powered devices should not add materially to the general background of radioactivity in the atmosphere. Also, during the operation of these devices at a launch pad, operational base, or test range, all harmful radiation should, under any circumstances, be contained either within the device itself or within the prescribed exclusion area. On return to earth, the devices should not create a local hazard to persons in the area.

Tompkins said that an operational failure could create a radiological problem in any of four phases in a space mission: at launch, midrange failure, failure to orbit, and postmission reentry. However, the basic safety criteria require that the devices stay intact even under conditions of explosion and fire during launch, and that the expected orbital life of the vehicle be long enough to allow the nuclear fuel to decay to innocuous levels before the vehicle reenters the atmosphere.

In the event of an operational failure in which a proper orbit is not achieved, Tompkins continued, the devices are designed to promote complete burnup of the fuel into submi-

cron particles that will result in wide dispersion and slow settling. However, he said, such a method of minimizing the consequences of an operational failure may not be appropriate when multimegacurie quantities of radionuclides are involved.

In April 1964, Tompkins reported, a space vehicle carrying a nuclear power source containing 17 kilocuries of plutonium 238 failed to achieve orbit and burned up at about 150,000 feet over the Indian Ocean. Some of this material was first observed in the filter samples collected by the Atomic Energy Commission's high-altitude balloon program at 108,000 feet at 34° south latitude in August 1964.

Traces of the material were found at about 110,000 feet in the northern hemisphere at 31° north latitude by January 1965. It was measured as far as 65° north in May 1965 when the first 1965 balloon samples were collected in Alaska. Near the end of 1965 the material had achieved essentially a global distribution in the stratosphere. Much of the material had settled to altitudes of about 70,000 feet by December 1965.

The time distribution of this material in the stratosphere and atmosphere at ground level can be expected to be quite similar to the time distribution described for stratospheric fallout from the atmospheric testing of nuclear weapons. The concentrations are very low, about a few disintegrations per minute per thousand cubic feet of standard air, and, Tompkins said, possible radiation doses associated with it are very low compared with those from the existing fallout and naturally occurring nuclides.

It is only reasonable to expect that developments in the systems for nuclear auxiliary power devices will be in the direction of increasing the total fuel inventory from the kilocurie range to the megacurie range, Tompkins stated. Personnel responsible for the design characteristics of the devices are acutely aware of the inherent necessity for preventing this application from causing widespread contamination of the environment by long-lived nuclides in a biologically available form. Two basic approaches now being considered are (*a*) dispersion into particles which are biologically inert, and (*b*) intact reentry in which there is no release. This approach might also be coupled with recovery of the unit, he said.

With the attention being given to this matter and the practice of careful safety reviews employed since the first flight of a nuclear power source, Tompkins believes that widespread contamination of the environment from the space program will not at all approach that which resulted from the atmospheric testing of nuclear weapons.

Standardization in Offing For Radioassay Techniques

The active participation of more than a dozen international organizations, Federal agencies, and professional societies in programs related to development of standard radioassay techniques represents both a challenge and a resource to the radiological health specialist.

The challenge, said Dr. Dade W. Moeller, associate director of the Kresge Center for Environmental Health, Harvard University School of Public Health, lies in the necessity of coordinating the activities of many diverse groups to provide a coherent body of analytical information for the profession. The resource lies in the number of people within these groups who can provide valuable consultation and advice in solving problems in the analysis of environmental samples. Because of this resource, Moeller recommended that the radiological health specialist take advantage of any opportunity to participate in an exchange of information with these groups.

One of the difficulties in developing standard radioassay techniques, Moeller pointed out, is the need for methods which are accurate and yet sensitive enough to determine near zero concentrations of radiocontaminants in an ever-increasing variety of media. Another problem results from the continual advancement in electronic radiation detection instrumentation, which frequently leads to publication of methods that are out of date. Also, in many instances, there is a lack of sufficient collaborative studies either to confirm the soundness of a method or to correct its deficiencies. Too often in the past, he said, techniques have been published which contained errors or lacked sufficient detail to be placed in routine use.

Through the American Public Health Association, all the mechanisms are available for the coordination of the efforts of the participating groups and for the direction of their talents to the more urgent current analytical problems. To this end, Moeller stated, the new Subcommittee on Radiological Methods for Environmental and Biological Samples, established by the APHA's Coordinating Committee on Laboratory Methods, deserves enthusiastic support from all radiological health personnel.

Under the subcommittee's program, individual societies and groups will still be encouraged to assist in the development of radiological methods for specific media, but all such procedures will be published within a single "standard methods" text. The subcommittee will also play a prominent role in collaborative studies to prove the acceptability of given procedures for standard status, Moeller said.

Some of the methods being considered for publication in the subcommittee's "Radiological Methods for Environmental and Biological Samples" are (*a*) Sr^{89}, Sr^{90}, and I^{131} in water, milk, and food (radiochemical methods), (*b*) gamma spectrometry of water, milk, and food (Ba^{140}, Ce^{137}, I^{131}), and (*c*) naturally occurring radionuclides in environmental and biological media (alpha and gamma spectrometry or radiochemistry). Hopefully, Moeller concluded, the first edition will be ready for publication by 1970.

Public Health Education Urged for Nuclear Power

It is time to recognize that replacement of fossil fuels by nuclear power is in the interest of public health, according to Alexander Grendon, University of California at Berkeley. This kind of public education, he suggested, should be the responsibility of public health agencies. Their

undivided responsibility for public health and safety has tended to make these agencies properly solicitous lest the applications of nuclear power, of radioisotopes, and of radiation-producing machines create situations harmful to health. Without diminishing that concern, Grendon feels that they may well turn now to view the asset side of the nuclear power balance sheet.

Grendon, a biophysicist at the Donner Laboratory, pointed out that public reactions have blocked or delayed several nuclear power proposals and they threaten to constitute the greatest single obstacle in the path of further development. Accelerated expansion of nuclear power applications, however, is critically needed.

Perhaps, he proposed, failure to win public support can be partly attributed to errors in timing—a failure to educate the public long before a proposal is made that affects a particular vicinity.

There seems to be evidence that early dissemination of full information has been helpful, Grendon said. But, he pointed out, no proof of the effectiveness of such a course of action can be established, since even a very intensive information program, begun well in advance of the formal procedures required by law, is no guarantee of success.

More important, however, than the question of when public education should begin with respect to a specific nuclear power proposal is the question of by whom should it be undertaken, in Grendon's opinion. He said that there is a widespread tendency to distrust large and impersonal agencies, both governmental and private, and the distrust is logically heightened when their utterances on safety may be conditioned by their other responsibilities. Even the most factual presentations of the electric utility company, or the manufacturer of reactor equipment, or the Atomic Energy Commission suffer from this handicap.

Citing some examples of situations in which risks of nuclear power development have been exaggerated, Grendon said that the alleged dangers of contamination from normal operation present a negligibly small risk compared to the serious risk arising from normal operations in which fossil fuels are burned.

The risk of a major accident, he continued, is more difficult to gauge; but the probability of an accident that might seriously affect the public's health has been made extremely low by ingenious designs that not only make initial failure unlikely but impose barrier after barrier between the radioactive materials and the public. The costs in lives and health of obtaining energy from fossil fuels are far from negligible, though less spectacular than the scenes envisioned by those who choose to dramatize the hazards of nuclear energy.

Grendon concluded that if the deaths and injuries attributable to the use of fossil fuel instead of electrical energy were tallied, it would be necessary to include not only the adverse effects of air pollution but also industrial accidents in mining and transportation of coal, asphyxiations and home fires, explosions of accumulated gas, and many other accidents—even the recent catastrophe in Wales when the slipping of a slag pile caused many deaths. The total would surely far exceed even the most pessimistic predictions of those who try to turn the public against nuclear power development.

Emphasis in Surveillance Now on Nuclear Facilities

After summarizing New York State's nuclear surveillance program, Sherwood Davies and associates from the Bureau of Radiological Health Services pointed out that surveillance today is based on a different need than it was in 1955 when the State health department's program began. Currently, they said, the primary reason for surveillance is the increase in nuclear facilities, rather than fallout from nuclear weapons testing.

In planning a new surveillance program, therefore, the authors suggested inclusion of the following considerations.

- Focus on areas where nuclear facilities are proposed or operating. Pre-operational surveys around larger facilities would cover the whole environment—its geography, topography, industry, agriculture, population, and other nonradiological facts.
- Sample far more selectively, but analyze more sophisticatedly—using such modern advances as automatic sampling, transmission of data by telecommunication system, electronic data processing, and the newest laboratory equipment and procedures.
- Aim sampling at particular radionuclides of health concern. Spend more time on techniques of monitoring and on reviewing results reported by the operator at the point of discharge.
- Look for possible new reconcentration pathways of specific nuclides and scrutinize known pathways. Use continuous samples rather than grab samples downstream from potential sources.
- Develop liaison with nuclear operators, to select and maintain sampling stations cooperatively. The authors believe that industry has the burden of proving no adverse effects on the environment, and that public health agencies should cooperate by sampling where industry does not and by confirming industry's data to assure environmental safety.

Most of these considerations indicate economy, and, the authors said, economy raises the question of whether the Federal Government or the States should evaluate environmental effects and continue to regulate radioactive releases from all sources. Presently, States are responsible for all nonradiological releases, and the Federal Government for radiological ones. Although it is difficult to avoid some jurisdictional divisions of labor, the authors feel that having two agencies at the same smokestack or discharge pipe could be avoided.

With the Federal Government responsible for setting release limits, a State may or may not survey these releases into the air and water. However, the authors stated, if a qualified State could regulate release limits, review industry reports on releases, and monitor the environment as needed, it could develop a total, integrated program. It could fit its surveillance more carefully to the particular case, considering such

plant-to-plant variables as thermal load on the watercourse, amount of radioactive releases, and other possible toxic constituents in the waste streams.

This is not a radical suggestion, the authors declared. The Atomic Energy Act provides for qualified States to take over some Atomic Energy Commission responsibilities, including regulation of byproduct, source, and special nuclear materials in quantities less than a critical mass. Fourteen States now have such agreements with the Atomic Energy Commission. Davies and coauthors proposed that the same proof of compatibility be required of a State wishing to handle the new responsibilities which they recommended.

An Operator's View Of Nuclear Facilities

Nuclear electric powerplants are safe to work in and to live nearby. Fewer accidents occur in nuclear powerplants than in fossil-fired plants. There are even fewer accidents requiring medical attention. Compared with national averages. powerplant work is generally safer than most other industrial activities.

These conclusions were voiced by Robert E. Kettner of the Consumers Power Co., Jackson, Mich., in presenting his view of nuclear facility planning and cooperation with the State health department. The company owns and operates a 75,000 kilowatt nuclear powerplant at Big Rock Point in the State.

The Michigan State Health Department has a well-qualified staff, Kettner said, which is located close to the company's technical staff and nuclear facilities. As a regulatory agency, the department provides a valuable, intimate control in behalf of the public to which both the industry and the health department are responsible.

The company's policy is to inform the health department well in advance of announcements to the public. Of course, Kettner stated, the company recognizes the importance of keeping the health department informed regarding Atomic Energy Commission regulatory licensing actions relative to the company's projects.

But equally important, Kettner continued, is the value received from exchange of ideas and information about more routine responsibilities. For example, since late 1960 Consumers Power has proceeded with an environmental survey of the Big Rock Point site and its environs. Air and water collection stations, using sampling equipment owned by the company, have been complementing other similar stations in the vicinity which are owned and operated by the health department. Exchange of technical data and continuing planning and cooperative contact between the technical staffs have proved most effective, he said. At the same time, he added, objectivity and independent collection evaluation and conclusions on the data have been maintained.

Although analyses of a variety of conceivable accidents indicate that even a major rupture of the main steamline outside the reactor containment would not create sufficient hazard to the environs to dictate complete implementation of an emergency plan, Kettner reported that such a plan has been prepared. The plan prescribes the actions to be taken in order of priority and the responsibilities of personnel for taking such actions, and it summarizes personnel and material resources available for assistance in minimizing radiation exposure.

Successful implementation of this plan, said Kettner, requires thorough and continuing indoctrination of plant personnel and continuing review with designated health department staff and other State and Federal personnel. Fortunately, personnel turnover in both the company and the health department is low, and this leads to even more effective cooperation and confidence, he stated.

Consumers Power has spent considerable time and effort regarding its relationship with hospital staffs near Big Rock Point, Kettner reported. Equipment has been provided to these hospitals and annual training programs are conducted by company representatives such as its medical consultant and its chemical and radiation protection engineer. On-site review of the provisions made with the hospitals is conducted periodically by the State health department accompanied by Consumers Power representatives.

Kettner attributed his company's successful and cooperative relationship with the health department to an effective communications system.

Alabama's X-ray Program Is Well Received

The success of Alabama's X-ray protection program was attributed by its State health officer primarily to the support that its health department received from the medical profession.

Dr. Ira L. Myers reported that in developing the program, the health department spent several years in training staff and preparing for medical and dental support. The interest of dentists in the safe use of X-ray units in their offices provided the stimulation necessary for a statewide dental equipment survey, he said. Many dentists requested surveys of their machines for defects or errors in collimation and filtration, and physicians also requested assistance to prevent unnecessary radiation to themselves and their patients.

A dental program was started in 1963. Myers said that the survey was successfully completed by using dental students who had been given a brief course in survey techniques and recording. Criteria established by the American Academy of Oral Roentgenology were used to determine the adequacy of filtration and collimation. A total of 708 units was inspected for proper filtration and collimation, and when deficiencies were found, filters and collimators were installed without charge to the dentist.

When registration and a survey of medical X-ray units was started in 1964, medical and dental students were employed. However, Myers said, the complexity of these units coupled with the inexperience of the student surveyors presented a few difficulties, which could have been avoided by having more professional supervision or by waiting for ade-

quate permanent staff to complete their training.

Despite these difficulties, many of the items were easy to observe and measure, and 968 radiographic and fluoroscopic X-ray units were inspected during the survey. The owners of the X-ray units were notified of any deficiencies found by the surveyors and requested to correct them. This was a voluntary program, and it was well received by the medical profession, Myers said.

During the survey period, a radiological health laboratory was being developed. Myers said that this laboratory complemented and expanded the scientific evaluations made by the technical staff. Measuring devices for accurate determinations, including equipment for radium leak testing, were a prerequisite for obtaining professional confidence in the program. The radium leak testing service proved to be an outstanding contribution to the control effort.

According to Myers, Alabama's experience pointed up that although correction of mechanical and equipment defects is an important phase of X-ray protection, the operational and educational efforts must be directed toward improvement in methods, techniques, and judgments by all personnel.

New York State Licenses X-ray Technicians

Pioneer legislation mandating licensure of X-ray technicians became effective in New York State on July 1, 1964. The legislation sets standards for eligibility for licensure for present and future practitioners. According to Howard L. Goldman and Alan R. Cohen of the New York State Department of Health, the legislation has encouraged the development of many new hospital-based X-ray technology schools and it should lead to the development of a statewide system of associate degree courses in 2-year colleges.

In 1964 New York State had about 30 two-year hospital schools. By the end of 1965, 67 hospitals were conducting or planning such schools, the authors reported. Many of these schools, they said, may eventually establish affiliations with community colleges under the following program.

The State departments of health and education and the State university are promoting community college courses offering associate degrees in X-ray technology. One experimental pilot program was started in a community college in 1965, and about 10 others were expected to start in 1966. The long-range goal is about 20 courses strategically located throughout the State. An obstacle to be overcome, the authors pointed out, is the shortage of qualified teaching technicians to act as program directors. Plans are underway, they said, to recruit such people and hold seminars in educational methods to prepare them for their new roles.

Of five amendments to the licensing law in 1965, two provided a special license for X-ray therapy technicians and a limited license for chest radiographers.

About 10 hospitals in the State use pure-therapy technicians in highly developed therapy departments. These technicians are trained almost to the level of health physicists. Without the therapy license, Goldman and Cohen noted, therapy schools could not be approved because they do not teach radiographic techniques or darkroom chemistry. Holders of these licenses are limited to therapy and not permitted to do diagnostic X-rays.

The limited license for chest radiographers was endorsed by many organizations conducting mass screening programs, the authors stated. These agencies have difficulty in recruiting X-ray technicians who are willing to do such limited work or to drive mobile units. The license limits the holder to X-raying the chest area, using only special equipment in which the tube and the cassette or hood are interlocked and beam-limiting devices, filters, and gonadal shielding of a permanent type are built into the equipment. Further, the authors pointed out, the chest radiographer can use this equipment only when employed by an agency engaged in a public health program; he may not be employed in a private physician's office.

LABORATORY

Ecology of *C. botulinum* Remains an Enigma

A recent spate of reports on botulism research, undertaken throughout the world, clearly indicates that *Clostridium botulinum*—particularly type E—is widely distributed in the aquatic environment and that it may frequently contaminate fish and other marine animals. However, in reviewing the literature, Dr. E. M. Foster and Dr. H. Sugiyama, Food Research Institute and Department of Bacteriology, University of Wisconsin, concluded that much is yet to be learned about the ecology of the organism and why it occurs in higher concentrations in some environments than in others.

The authors reported highlights of studies on the occurrence of *C. botulinum* in nature, growth of type E in food, factors affecting growth, resistance of spores and toxin, characterization of botulinal toxins, methods of isolating and identifying the organism, animal botulism, and *C. botulinum* type F.

A Swedish worker, in 1961, was the first to report that type E grows poorly in certain foods. It produced toxin readily in fresh or cooked herring and cod, but not in shrimp, crabmeat, or a variety of cured meat and fish products. Subsequently, other investigators inoculated type E spores into several cured meats, smoked eel, and smoked salmon. Toxin formation was observed in a jellied ox tongue containing 1.5 percent salt, but no toxin was produced in either the smoked eel or smoked salmon.

In studies of the effect of vacuum packaging on the growth of *C. botulinum* in cured meats, smoked fish, irradiated fresh fish, and other foods, several groups of investigators generally agreed that the composition of the food and other environmental conditions regulate growth rather than how the food is packaged.

Most of the work with *C. botulinum* type E has been done with complex natural media, but a chemically defined medium is needed for nutritional studies of sporogenesis and toxigenesis, the authors stated. Several investigators have prepared synthetic media in which type E will multiply, but growth is sparse and morphology of the cells is atypical. A chemically defined medium in which type E is said to grow, produce toxin, and sporulate normally has been developed recently. A report of this medium, as well as other developments in botulism research, will be published in the "Proceedings of a Symposium on Botulism," held in Moscow, July 1966.

Speedy Diagnosis of Rubella By Public Health Labs

Virology laboratories can be of direct assistance to physicians in diagnosing rubella infection in pregnant women, according to a report by Dr. Kenneth L. Herrmann and associates, Communicable Disease Center, Public Health Service. Techniques such as the complement fixation and the indirect fluorescent antibody tests are now capable of reducing the length of time necessary for laboratory diagnosis to a few days rather than weeks, and place rubella serodiagnostic methods within reach of most State public health laboratories, they said.

The authors summed up the following clinical situations where the assistance of a virology laboratory in the diagnosis of rubella is indicated.

- To confirm suspected rubella infection in pregnant women in order to exclude the possibility that the illness was caused by another agent.
- To determine whether subclinical infection has taken place in a pregnant woman exposed to rubella, especially if gamma globulin has been administered.
- To establish a more precise diagnosis of presumptive complications of rubella, such as thrombocytopenic purpura and encephalitis.
- To determine the immune status of pregnant women (first trimester) with documented exposure to rubella.
- To confirm suspected rubella syndrome diagnosis, especially in cases where a history of maternal rubella during pregnancy is lacking.

With the introduction of rubella vaccines and the more frequent use of gamma globulin in pregnant women exposed to rubella, the need for laboratory support in rubella diagnosis will continue to increase, the authors concluded.

See *Pasteurella multocida* As Source of Human Ills

The importance of *Pasteurella multocida* as a cause of disease in man is vastly underrated, in the opinion of Dr. William T. Hubbert of the Communicable Disease Center, Public Health Service, and Merton N. Rosen of the California State Department of Fish and Game.

Reporting the results of a cooperative study by their agencies to investigate the epidemiology of *P. multocida* infections, the authors said that these infections which occur in a wide range of birds and mammals have long been believed to be transmitted to man very rarely—primarily by animal bites. The possibility of a significant reservoir of infection in man with resultant interhuman transmission has rarely been considered, they added. However, in 1 year the study uncovered 113 cases in humans, 69 of which resulted from animal bites. In addition, Hubbert and Rosen reported that the isolates were received from only 27 of the 50 States, with 38 from 1 State.

The question of the importance of animal contact remains unanswered, the authors stated. Five of 32 patients with respiratory tract infection gave a history of no animal contact. On the other hand, 14 had had some contact, and for 13 it was unknown whether or not there had been contact. Of 12 patients with infections in other sites, 1 reported no animal contact and 8 reported some.

Among the 22 patients who reported exposure to animals, the species distribution was 7, dog only; 3, cat only; 5, farm animals; 2, dog and farm animals; and 1 each to wildlife; cat and parakeet; parakeet; dog, cat, and wildlife; and cat and wildlife.

Hubbert and Rosen concluded that greater emphasis must be placed on syndromes other than those related to animal bites. In fact, they said, virtually any organ may be affected and the resulting disease may be life-threatening. Also, they added, there is some suggestion that the disease may be particularly hazardous for older persons. More information is needed on these and other factors before a definitive estimate of the current status of *P. multocida* infections can be made.

Reoviruses in Sewage Need Further Study

A high rate of recovery of reovirus from sewage and partially treated effluents in San Diego and Santee, Calif., indicates that this virus should share the attention given to enteroviruses and adenoviruses in studies of sewage treatment processes. As Beatrice L. England and associates, County Department of Public Health, San Diego, pointed out, the role of reoviruses in human and animal diseases has yet to be defined.

During a 39-month study, reoviruses were recovered from Santee sewage more frequently than ECHO viruses, Coxsackie viruses, or adenoviruses, the authors reported. Except during and following county-wide administration of oral polio vaccine, more specimens were positive for reovirus than poliovirus. Sixty-eight percent of 103 concentrated raw sewage samples and 82 percent of 93 concentrated activated sludge effluents were positive for reovirus. In a 1-year comparative study of raw sewage in San Diego, 70 percent of 32 concentrated specimens were positive for reovirus.

Multiple tube tests in African green monkey kidney cultures were performed on 30 unconcentrated raw sewage samples collected from Santee and San Diego during periods not affected by mass oral vaccination, primarily in summer and fall. These cultures yielded a preponderance of reoviruses over all other viruses.

The results of the study suggest that reovirus is endemic in the Santee and San Diego area, but the

specific source has not been established. England and associates discounted dairy wastes as being of major importance because equal numbers of reovirus isolations were made from special samples collected before and after these wastes entered the sewer line. Human feces may not be a major source, they feel, because only one reovirus isolation was made from human stool specimens sent to the county public health laboratory for diagnosis.

England and associates postulated that the paucity of reovirus isolations from patients' stool specimens coupled with the high prevalence of reovirus in sewage may indicate that the virus is an agent responsible for widespread human infection of predominantly subclinical or mildly symptomatic manifestation. Or, the culture techniques used may have failed to detect reovirus present in the stool specimens. They proposed that sewage may contain a reovirus activator not present in human stool specimens, in light of demonstrations by other investigators of proteolytic enzyme activation of reovirus. Enzymatic treatment of human feces might uncover otherwise undetected reovirus.

Cytomegalovirus Infection Widespread in Atlanta

Cytomegalovirus (CMV) infection, or salivary gland virus infection, is widespread among selected population groups in Atlanta, Ga., according to the results of a study reported by Dr. John Starr, Dr. John Stewart, and Dr. Helen Casey of the Public Health Service's Communicable Disease Center. CMV infection has been associated with liver disease, hemolytic anemia, infectious mononucleosis-like illness, and interstitial pneumonia. It is also the agent in cytomegalic inclusion disease of the newborn, although severe congenitally acquired infection is rarely observed.

The study was undertaken to obtain more information on the infection's pattern of spread, persistence in the population, and clinical signs. Serum specimens were taken from patients in three Atlanta hospitals. The subjects represented lower-, middle-, and middle- to upper-income groups.

A consistently higher prevalence of CMV complement fixation antibody was seen in the lower-income group. In this group, infection occurred at an earlier age and attacked a higher percentage of persons, the authors reported. By 5 years of age, 35 percent of the lower-income group had acquired CMV antibody in contrast to 20 percent in the middle-income group. More than 90 percent of the lower-income group had positive antibody after the age of 17 years. In both groups prevalence of antibody increased with age, and after age 40 it reached almost 100 percent.

For women in the childbearing years, 15 to 40, the overall rate for antibody was 94 percent in the lower-income group and 69 percent in the middle-income group. In a small sample from the high-income group aged 20 to 40 years, 13 of 21 women had antibody.

A simultaneous study of CMV infection in family contacts of 15 children known to be excreting CMV helped to explain the mechanism of intrafamily spread, the authors said. First, the study revealed that family infection is widespread, although the older children may not be affected in the current wave of transmission. Second, a large number of susceptible family members were not infected after 18 months of exposure, indicating that the virus spreads through the family quite slowly.

The mother's role in the spread of CMV infection is not yet clear, the authors reported. They indicated that some of the index subjects under 3 months of age, with stable antibody levels, were most likely infected congenitally. However, they added, prolonged excretion of virus coupled with the birth of additional susceptible children serve to maintain the intrafamily transmission of the infection.

The authors concluded that CMV infection is quite unique among the viruses. The horizontal pattern of infection, with spread from child to child, resembles that of herpes simplex virus, but its vertical pattern, with spread from mother to child, is similar to that of rubella. Both rubella and CMV show prolonged excretion after congenital infection, but only CMV shows prolonged excretion after acquired infection. Rubella infection is both epidemic and endemic, while CMV infection appears to be endemic. The number of women of childbearing age susceptible to both infections is nearly the same, yet the number of children with congenital rubella infection seems to be far greater than the number with congenital CMV infection. Perhaps, the authors proposed, only a fraction of the congenital CMV infections are recognized.

Syphilis Control Program Seeks Early Latent Cases

Epidemiologic followup of all persons with syphilis of less than 1 year's duration regardless of presence or absence of physical signs has proved productive for the New York State Health Department, according to two of its officials.

Dr. Ward L. Oliver and Dr. Albert Harris pointed out that infection may not be apparent by routine physical examination during the first year following exposure to syphilis, because of invisible or microscopic lesions. Therefore, they recommended, health officials should adopt a new criteria for early latent syphilis and make the same epidemiologic effort for this category as for primary and secondary syphilis.

One of the most difficult phases of syphilis control is the determination of infectivity of latent syphilis, according to the authors. Latent syphilis is that stage of the disease in which there are no visible clinical signs of infection. The term "latency" is not definitive since it implies inactivity. Perhaps, the authors proposed, it should be replaced by the term "asymptomatic," which more properly describes this stage. The line of demarcation between early latent and late latent syphilis is arbitrary, they added; it is based on relative degree of infectivity in the two stages, with the assumption that during the early latent phase the disease is most likely to return from noninfectiousness to the infectious stage.

New York State, Oliver and Harris reported, places equal epidemiologic emphasis on three categories of syphilis: primary, secondary, and early latent (asymptomatic syphilis of less than 1 year's duration). Private physicians or clinics are required to report all syphilis patients by their stages of disease. Asymptomatic syphilis of less than 1 year's duration is considered infectious and is reported as such under the category of early latent syphilis. In the authors' experience, 1 year following exposure is a good average for infectivity regardless of whether or not a diagnosis of primary or secondary syphilis has been made. This concept, they said, has paid off well from the standpoint of epidemiologic productivity.

Early Latent Syphilis

Criteria for diagnosis of early latent syphilis in New York State requires a positive serologic test for syphilis plus one of the following: (*a*) history within the year of lesion or rash simulating primary or secondary syphilis, (*b*) verified history of negative serology within the year, (*c*) history of exposure to a known patient within the year, or (*d*) named contact of known patient within the year.

The State's interpretation of early latent syphilis is based on the fact that syphilis is a systemic infection almost from the time of exposure. It is continually infectious during the primary and secondary stages and intermittently infectious for an indefinite time after exposure. The infectiousness of asymptomatic syphilis is probably accompanied by the occurrence of unrecognized and undetermined physical signs of minute variety, and the period of infection may be such that the patient will have signs one day and none the next. There are many variables, Oliver and Harris reminded, and in some cases the period of communicability may be 6 months to 20 years.

Citing casefinding data for the State, excluding New York City, Oliver and Harris reported that during 1961–65, interviews with 2,992 patients having primary or secondary syphilis yielded 1,253 or 41.9 percent new cases in the early infectious stage. Interviews with 1,493 patients having early latent syphilis yielded 399 or 26.7 percent new patients, whereas the national casefinding average for early latent syphilis during 1965 was 20.5 percent.

Diphtheria Antitoxin Levels Found by Tissue Culture

The tissue culture method using rabbit kidney cells for the titration of diphtheria antitoxin in human serums is sufficiently sensitive to assay diphtherial immunity, according to the results of a study reported by Dr. Joseph H. Schubert, Geraldine L. Wiggens, and Dr. Gerald C. Taylor from the Public Health Service's Communicable Disease Center.

Primary rabbit kidney, primary rhesus monkey kidney, and KB cells were studied to determine which was best for use in the tissue culture method, and rabbit kidney cells were selected because of their greater sensitivity to diphtheria toxin. Improvements were made in the growth of rabbit kidney monolayers by feeding the cultures every 2 days and placing them on maintenance medium as soon as confluent layers developed. Monolayers became more uniform when the screw caps were replaced by rubber stoppers to seal the tubes.

The authors noted that the hemagglutination test is unacceptable for determining levels of diphtheria antitoxin in serums because it is inaccurate when compared with the classic rabbit intradermal test. Since the animal method is tedious and expensive, however, the authors studied the applicability of the tissue culture method.

Hospital Patients' Rooms Are Not Really Clean

More effective cleaning methods or at least more efficient application of current standard techniques for floors and overbed tables in rooms of hospital patients are urgently needed, according to a report by several members of the APHA's Subcommittee on Microbial Contamination of Surfaces.

Microbial surveys were conducted by the committee in 17 hospitals in 1964 and 1965. Microbiologists in different parts of the country used the Rodac plate technique to determine microbial counts for the floor areas beside patients' beds and for overbed tables. The mean floor counts for 2,430 samples were 230 before cleaning and 99 after cleaning. For 1,600 overbed table samples, the means were 75 before cleaning and 32 after cleaning. Tentative guidelines for Rodac plate counts cautiously suggested by the committee for cleaned floors in patients' rooms were 0–25, good; 26–50, fair; and more than 50, poor. For cleaned overbed table surfaces, the committee thought that less than 10 organisms per Rodac plate should be obtainable.

Austin K. Pryor, Economics Laboratory, Inc., New York City, and co-authors felt that highly contaminated mops were an important factor contributing to the high bacterial counts on floors. This was confirmed, they said, by several investigators who found extensive contamination in cultures of mop samples.

Such mop contamination may seem contradictory when a hospital is using a competent disinfectant and personnel are instructed to wash their mops, by hand, at the end of each day, the authors said. However, they pointed out, it is difficult to prevent heavy contamination of mops by any known practical chemical means. One investigator found that only daily autoclaving or daily laundering with complete drying in a hot-air laundry dryer controlled contamination.

In most of the hospitals surveyed, nurses rather than housekeeping staffs cleaned the overbed tables. The cleaning methods were haphazard, with materials that were more handy than appropriate, the authors stated. In the committee's opinion, the microbial counts were unusually high considering that overbed table surfaces should be quite easy to clean. The authors suggested that the cleaning functions be transferred to housekeeping personnel or improved standard procedures be enforced in nursing service.

Studies are underway to develop

recommended procedures for cleaning floors of hospital patients' rooms so that housekeeping personnel can meet these guidelines within the limits of reasonable time and effort.

Diagnostic Laboratories Need More Flexibility

Too many diagnostic laboratories now being planned and built are too small and will be outgrown in the next few years, in the opinion of Jesse C. Norman, Communicable Disease Center, Public Health Service. He suggested that these laboratories should be designed for maximum interchangeability.

Norman, who is chief of the Management Consultation Unit, Laboratory Consultation and Development Section, recommended that problems in planning be analyzed in terms of their effect on the availability of bench and equipment space. Air-handling systems should be capable of providing air separation of spaces and maintaining a temperature which is plus or minus 2° F. Because cooling and heating loads in a laboratory are 100 percent variable, he said, an individual room control air-conditioning system is essential. Wet and dry services should be available to each laboratory module.

States Can Help Improve Clinical Laboratories

The design and implementation of an intrastate clinical laboratory improvement program is to a large extent the responsibility of the State health department, stated Dr. John E. Forney, assistant chief for consultation of the Laboratory Consultation and Development Section, Communicable Disease Center, Public Health Service, in discussing the role of the State in clinical laboratories.

In order to develop a broad comprehensive program, Forney said, there should be cooperation with other interested agencies, organizations, and institutions. Such cooperation, he added, can best be achieved by the use of an advisory committee appointed by the State health officer.

According to Forney, all clinical laboratories should be registered, and registration information should include location of the laboratories, numbers and types of persons working there, the size of laboratories relative to workload, and the adequacy of facilities and equipment. A performance evaluation should be instituted, he said.

Because of the shortage of adequately trained personnel for laboratories, Forney suggested that efforts be made to interest high school students in careers in the medical sciences. He pointed out that a certification program should also be provided.

Forney concluded that the States can make a significant contribution in the improvement of clinical laboratory operations. Specifications for reagents need to be developed, and reagents should be tested to assure that they meet published specifications. Much of this, he said, can and should be done at the State level.

STATISTICS

Early Warning System For Nation's Drugs

More than 2,000 notices of claimed investigational exemptions for new drugs are currently in effect, reported Dr. Donald G. Levitt, acting director, Division of Epidemiology, U.S. Food and Drug Administration. These notices range from a state of inactivity to an extremely active state involving hundreds of individual trials with perhaps thousands of patients within each trial, Levitt stated. At any given moment in the United States, many thousands of patients are undergoing active clinical experiences while taking new drugs, he continued. The drugs are administered by physician investigators.

The information on individual clinical experience is submitted to the sponsor of the drug investigation, who evaluates the information in light of safety and efficacy of the compound. The sponsor, in turn, submits this information to the FDA. This continuous flow of data, Levitt said, administratively regulated by the FDA, flows at an ever accelerating rate from clinics and private physicians' offices, from centers of research, and from the pharmaceutical industry to the Government.

The information is handled and evaluated by pharmacologists and pharmacists, statisticians, operations researchers, computer technologists, clinical investigators, clinical pharmacologists, biochemists, and clinicians. A considerable segment of the medical and paramedical resources of the United States are committed to this effort.

Evidence is gradually accumulated in the form of a new-drug application that a preparation is safe and efficacious for a specific use or uses. The contraindications to its use are also noted as well as warnings in the handling of the products. This information is assembled in the form of drug labeling by the manufacturer and approved by the FDA on the basis of the merits of the drugs as demonstrated in the new-drug application. The sale of the drug is then permitted.

The Kefauver-Harris amendments require that holders of new-drug applications establish and maintain records and file reports, which are necessary to facilitate the determination whether there may be grounds to suspend or withdraw approval of a new-drug application. Levitt said this involves information received or otherwise obtained from any source; clinical experience, animal experience, studies or tests involving chemical, physical, or biological properties, and manner of distribution of the drug. Reports are submitted quarterly during the first year of approval, semiannually the second year, and each year thereafter. In addition, immediately, or no later than 15 days after receipt, information is required concerning drug labeling mixup, drug contamination, or deterioration. and information concerning any unexpected side effect, injury, toxicity or sensitivity reaction, or any unexpected incidence or severity whether or not de-

termined to be attributable to the drug. The FDA, Levitt reported, has enlisted the assistance of many of the leading clinical centers of the United States through the Hospital Adverse Reaction Reporting Program to report noxious, unexpected clinical experience related to the use of drugs.

These programs and requirements involve the receipt of 3,500 to 4,000 drug adverse-experience reports per month that must be carefully scanned for an indication that the pharmaceutical is not behaving as it should. This is the backbone of FDA's early warning system, Levitt said, which was developed in response to the need for a more comprehensive and rapid surveillance of drug-induced effects than the scientific literature could provide.

The Responsibility Of the Researcher

I am asking you to consider along with me the impact of our activities on the human beings about whom we wish to collect data and to reflect with me on the liberties we sometimes are inclined to take on behalf of our research at the expense of the individual respondent or research subject. This is the statement of Dr. Norman A. Hilmar, Office of the Surgeon General, Public Health Service. Hilmar continued: I should like to suggest the following questions as a checklist for the researcher to run through before he begins to collect data. These questions, which are hardly original with me, should help the statistician to confront himself and to seek out the judgment of thoughtful colleagues regarding the efficiency, the legality, and the moral propriety of his proposal.

1. Is a particular proposal's objective worth the effort and the cost involved to the respondents as well as to the researcher?

2. Is the method a reasonable and efficient one for the purpose of accomplishing the stated objective?

3. What will be the impact of the data-collection activity on the respondent or on the subject? Is it burdensome, bothersome, upsetting, or self-incriminating?

4. Will the subject be adequately informed about the purpose of the study, his part in it, and his rights? Are we dealing with him honestly and openly, or are we trying to skew the facts of the case in order to gull him into cooperating in something we want to do?

5. Is the language of the assurance clear? Will the subject know the extent to which information about him will be made available to others? Will someone else, reading the assurance a year hence, know with certainty what uses may be made of the individual data and what uses are prohibited?

6. Is the respondent legally competent and free to participate voluntarily or to refuse to participate?

7. Is some custodian of individual records—a physician or hospital administrator—entitled to reveal the contents of those records to the researcher? Does the custodian have the subject's consent?

8. Will there be adequate safeguards against unauthorized access to the data for which confidentiality has been promised? Will we safeguard the data with the same zeal we use to elicit the cooperation of the persons participating in the study?

The above questions, Hilmar maintained, permit and foster a meaningful dialogue between the researcher and his potential respondents or research subjects. If we deal with research subjects as persons, Hilmar said, treating their rights to dispose of their time and to reveal facts about themselves or not—as we would wish others to treat us—we should be able to welcome public scrutiny of our research activities.

Use Your Head

Volume in an epidemiologic study depends on (*a*) the number of subjects, (*b*) the number of records per subject, and (*c*) the number of items of information per record. If the volume is small in all respects, E. Cuyler Hammond and associates, Epidemiology and Statistics Department, American Cancer Society, highly recommend the use of no more equipment than pencil, paper, adding machine, and desk calculating machine; and they recommend that the investigator personally carry out the clerical tasks. In thus keeping close to his data, they say, he will have a better understanding of his problem and will be in the best position to observe unexpected oddities. The birth of a new idea most often occurs when an unexpected oddity comes to the attention of a trained and imaginative mind. To reduce this possibility is a tragedy, they continued.

Modern methods of data processing are marvelous, asserted Hammond and co-workers. They permit us to undertake projects on a scale never before possible. However, while data processing machines are necessary for analysis, analysis or "reduction of data" implies far more than mere processing. It requires thought, evaluation, and interpretation, and no computer yet built can accomplish these for us, they said.

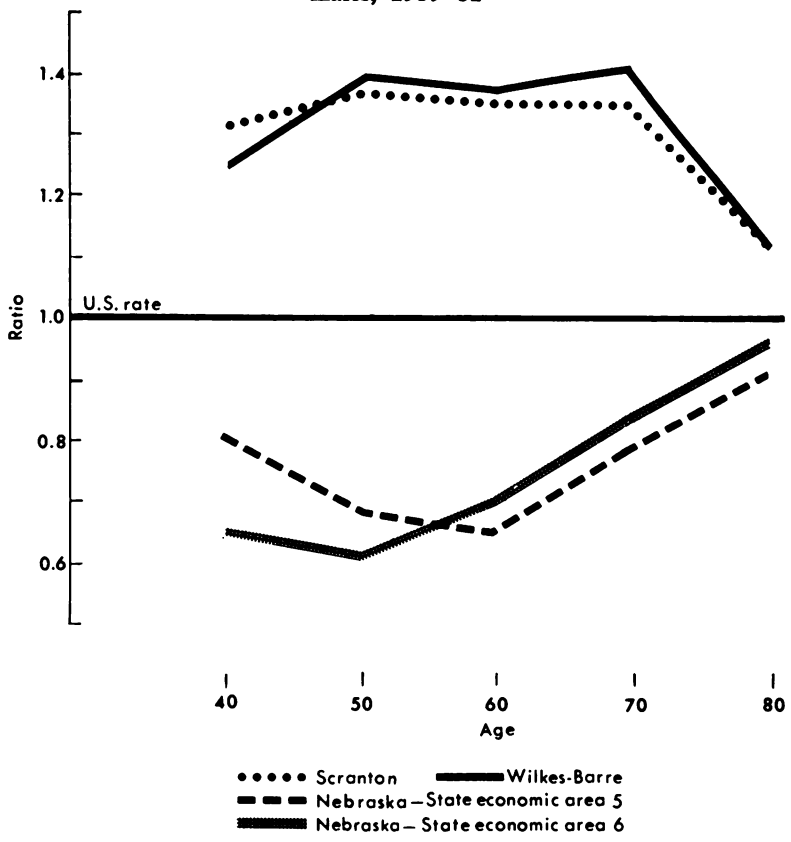
The main danger in the use of mass production equipment, Hammond and associates said, is that unless wisely employed it tends to separate the investigator from intimate knowledge of his original data. In some instances, they contended, this can lead to drawing erroneous inferences from composite figures, and it can lead to overlooking unexpected or rare occurrences of great significance. Hammond and co-workers attempt to overcome this so far as possible by using supplementary procedures. The additional work for the investigator is well worth the effort, they stated.

Risk of Dying Greater in Some Areas

All-cause death rates for white persons aged 45–64 years for 1959–61 have been analyzed for the 509 State Economic Areas of the United States by Herbert I. Sauer and Dorothy M. Moore of the Public Health Service's Heart Disease Control Program, Ecology Field Station, Columbia, Mo. The lowest rate areas are chiefly in the Great Plains and the highest rate areas are in the East, similar to the pattern of mortality for 1949–51, Sauer and Moore said.

For white men, the risk of dying in middle age is about twice as great

Ratio of age-specific death rates for selected areas to U.S. rates, white males, 1959–61



in the Wilkes-Barre and Scranton, Pa., metropolitan areas, as in portions of rural Nebraska (see chart).

Lifetime migration does not appear to have any marked effect on the risk of dying, the researchers continued. Those born in West North Central States but residing in a different State at the time of death had rates very similar to those who had moved into the specific West North Central States from other States.

While geographic patterns of death rates for women are similar to those for men, they are not identical, Sauer and Moore stated. The lowest rates for women are concentrated in the Southwest, although they are low throughout the Great Plains. The highest rates for women are concentrated in the Middle Atlantic States; for men, they are to a great extent concentrated in the Southeast.

If the rates of the lowest rate areas had applied to the entire United States in 1959–61, Sauer and Moore said, there would have been approximately 100,000 fewer deaths per year under age 65 alone.

ALCOHOLISM AND NARCOTICS

Children's Deviate Behavior Forecasts Drug Addiction

A high degree of drug-free rehabilitation over a relatively long test period was achieved in a recent demonstration program in Puerto Rico. Of 112 ex-heroin addicts followed for more than 3½ years after completion of intensive treatment, a total of 7 patients relapsed.

Dr. Efren Ramirez, coordinator of addiction programs for New York City, said that the successful results were partly due to several interrelated detection programs. (Ramirez was founder of the Addiction Research Center of Puerto Rico's Mental Health Program and director from 1961 to 1966.) Within a basic system of interdisciplinary services, he explained, these detection programs served as powerful pretreatment induction tools and provided a tight network of feedback information which made effective followup possible.

In the demonstration program, community orientation centers, located in local storefronts, were manned by rehabilitated, indigenous ex-addicts. The job of these ex-addicts was to identify, through personal peer-level street contacts, persons who were addicted or who were abusing dangerous drugs and chemicals.

In neighborhoods where addiction existed, parents and close relatives of addicts, along with local potential employers, were organized for mutual support and for orientation about drug addiction. A team, usually consisting of a trained parent, an ex-addict, and a community worker, would lead the group in discussions designed to help group members identify the addiction problem more clearly and prepare them to reinforce rehabilitation efforts with the individual addict. Another important function of the group was to detect and identify the early behavioral symptoms that often antecede addiction.

In a program to train youths as leaders, candidates for training were selected from youngsters who were reported to be gravitating toward addictive behavior. The technique relied on in the training was peer-group reality confrontation under the guidance of experienced youth workers; some of these workers were rehabilitated ex-addicts. A similar training program was operated for adults.

Juvenile evaluation and prevention units, operating in a variety of settings—public health district centers, YMCA's, day care centers—provided youngsters with the services of a referral team made up of a caseworker, occupational therapist, physician, and psychiatrist or psychologist. Trained ex-addicts participated in these guidance efforts.

All of these services, commented Ramirez, relied on early identification of deviated behavioral patterns for the detection of addiction. Drug abuse did not have to be a part of the pattern to make the patterns significant, he pointed out.

These techniques are being implemented in New York City, Ramirez reported.

Drug Addiction Patterns Similar in Both Sexes

Addiction patterns and personal and family characteristics of female drug addicts are similar to those that have been demonstrated in male addicts. Dr. William M. Bates and Joyce E. Williams of the Public Health Service Hospital, Fort Worth, Tex., presented their data for this conclusion.

Studies of drug addiction in the United States, the authors said, have revealed a heroin pattern that is found chiefly in northern States and a misuse of legal drugs (including cough medicine with codeine and paregoric) that is found chiefly in the South. The northern pattern is characteristic of metropolitan areas and includes a great overrepresentation of Negroes, Puerto Ricans, and Latin Americans. The so-called southern pattern is rural and found almost exclusively among white persons. In the northern pattern, the addict is characteristically initiated into drug use by friends, family, or spouse; in the southern pattern, by physicians prescribing drugs for illness.

The data on the female drug addicts were obtained in interviews with 154 who were admitted successively to the Public Health Service Hospital in Lexington, Ky., during the last 6 months of 1965. Forty-seven of the women said that physicians prescribing drugs for illness initiated them into drug use. Most of the remaining 107 addicts reported that a friend, family, or spouse introduced them to drugs. For a few women, in the medical or paramedical professions, addiction was self-initiated.

Physician-initiated addicts and other-initiated addicts lend themselves to comparative analysis of two separate patterns of drug use, according to the authors. The physician-initiated female addicts were much more likely to be white. On the average, they were also about 12 years older at time of admission than the other-initiated group and about 7 years older at time of first drug use. They were much more likely to come from a family where the father held a white-collar job and the mother did not work.

Addicts in the physician-initiated group were more likely to have finished high school and to have had some training for a job. They were more likely to report a white-collar position as their usual occupation. They were also much more likely to reside in rural or small towns of the South and to deny use of heroin and any history of arrests.

Narcotic Treatment Programs Need Impartial Evaluations

Directors of all major narcotic treatment programs should join in sponsoring an impartial committee to set standards for systematic reporting of treatment data and for evaluation of results. Dr. Vincent P. Dole and Alan Warner of Rockefeller University and the Beth Israel Medical Center, New York City, made this proposal because they found the reporting of narcotic treatment programs in the medical literature to be "chaotic."

Most reports, the authors said, concern patients who apparently are treated for a limited period in an institution and then lost. The success of programs in long-term abstinence or rehabilitation remains undefined. Information on the type of patients treated is also generally inadequate. Inadequate records can lead to repetition of past failures, such as building large hospitals for institutional treatment, they warned.

In dealing with such a complex phenomenon as addiction, a variety of techniques will likely be required for successful rehabilitation, Dole and Warner noted. Services will need to be related to the various needs of addicts of different ages and backgrounds. Thus, any agency charged with prevention and control of addiction, they said, should support research programs to test alternative approaches, and all approaches will require evaluation.

The committee doing the evaluation should have the respect of all parties. Members of the committee, however, need not be experts in the narcotics field. Indeed, according to Dole and Warner, the committee's expertise preferably would perhaps lie in other fields of public health. The authority behind the committee should likewise be independent.

The evaluation committee must, for the most part, rely upon data provided by the program under review, but it has to be able to verify critical data. On the other hand, the authors cautioned, intrusive methods of verification cannot be allowed to destroy the patients' confidence or interfere with their rehabilitation.

Standardization of reports facilitates both the collection of data and the necessary separation of operational facts from research studies. Forms were therefore developed, Dole and Warner reported, for tabulating initial history and social data, weekly reports on each patient's medical and social status, and preliminary and final reports made by the lawyer for the program whenever a patient is arrested or has any other legal difficulty. These forms are designed for machine analysis.

If used by all major narcotic control programs, said Dole and Warner, these or similar forms would provide a basis for meaningful comparison of results and contribute to efficiency of treatment.

Restrict Alcohol Availability To Reduce Liver Cirrhosis

Mortality from cirrhosis of the liver, the 11th leading cause of death in the United States in 1964, is apparently directly related to per capita consumption of alcohol from spirits and wine. Dr. Milton Terris, professor of preventive medicine at the New York Medical College, presented evidence from several countries to support this conclusion.

The 1964 mortality rate in the United States for liver cirrhosis was identical with the high rate of 1914, Terris pointed out. During the same

period the British succeeded in lowering cirrhosis mortality rates by 70 percent.

From 1900 to 1914, the author said, the death rate for cirrhosis of the liver varied in the United States between 13 and 15 per 100,000 population. It dropped precipitously during World War I, reaching a low of 7 in 1920, where it remained for 14 years—through 1933—and then began to climb until it reached the 1914 level in 1964.

In England and Wales and in Paris, there was also a sharp drop in cirrhosis death rates coincidental with World War I. During the period 1920–33, only in the United States did the rate remain stationary. In Paris, the rate climbed during this period, but fell sharply from 1942 to 1948, a period in which wine was limited by rationing to one-half to one liter weekly. These rapid changes in death rates are consistent with the clinical course of the disease in the individual patient, Terris observed.

In Great Britain, restrictions on alcoholic beverages continued after World War I. Hours of sale were still limited and taxes on them were progressively increased. Consumption in England fell from 0.59 gallons per head in 1913 to 0.205 in 1936. In England, cirrhosis of the liver is greatest in the highest social class. Only the well-to-do can afford the luxury of dying from this ailment there, the author said. In the United States, on the other hand, mortality from this cause is greatest in the lower social classes.

Up to 1948, the cirrhosis mortality rates in the United States in nonwhites had lagged, but since then their rates have climbed more sharply than the rates in whites. The depression, which bore down more heavily on nonwhites than whites, may have been partly responsible for the early lag, the author suggested. Urbanization of nonwhites in the forties and fifties may have contributed to the rise in more recent years.

The highest mortality from cirrhosis of the liver occurs in waiters, bartenders, and counterworkers—workers with maximum exposure to alcoholic beverages. An intriguing observation on occupational difference in cirrhosis mortality, Terris noted, is the high mortality for State and local public administration as compared with the mortality for Federal public administration. The author proffered no explanation.

The crude cirrhosis death rate in males is approximately twice that in females, the author pointed out. Before adult life, on the other hand, there is no sex difference in mortality. These facts, too, are consistent with the hypothesis that alcohol consumption is an important factor in liver cirrhosis in adults.

Programs for control of cirrhosis of the liver which are limited to health education and treatment of the alcoholic, Terris stated, are not enough. Effective prevention, he said, requires full use of governmental fiscal and regulatory measures to reduce the per capita consumption of alcohol.

Alcoholism as a Public Health Problem

Alcoholism is an illness affecting an estimated 5 million persons in the United States. In addition to the individuals directly affected, this disease affects indirectly larger segments of the population and involves in its control a number of social, legal, and health institutions.

Prejudice and misinformation contrary to scientific advances in the field of alcoholism hamper the development of preventive, control, and early treatment programs.

Experience has shown that the effectiveness of prevention, control, and treatment of any public health problem is in direct ratio to the degree of public health understanding and acceptance.

The American Public Health Association urges all State and local health departments to initiate programs aimed at securing public acceptance of the available scientific knowledge and advancement in alcoholism so that appropriate preventive and treatment programs can be established.—*Resolution adopted by the American Public Health Association in 1962*—Amer J Public Health *53: 106–107, January 1963.*

Study Range of Problems In Problem Drinking

In studying the epidemiology of problem drinking, a range of types of problems should be covered, stated Dr. Genevieve Knupfer. She is project director of the California Drinking Practices Study, Mental Research Institute, Berkeley. Knupfer presented some preliminary results of the study to show the importance of including a range of types of problems.

In devising questions for a survey of drinking problems, attention must be paid to the intensity of the problem, its recency, and the wording of the questions, Knupfer declared. The particular questions asked, the distinctions between problem areas, the intensities of the problems, and the time factor determine not only the resulting prevalence figures but also the relative standing of population subgroups. Anything not asked about will remain undiscovered. Not asking, she noted, is a far more important source of error than false statements by the respondent.

In the California survey, about 1,000 persons representative of the adult population of San Francisco were asked a multitude of questions about their drinking and about other matters thought to correlate with drinking. Re-interviews are planned, Knupfer stated, 6 years after these preliminary interviews.

To avoid having to define alcoholism, the term "problem drinker" was used in the study. Any problem connected fairly closely with drinking was considered to constitute a drinking problem. Drinking problems were categorized as extrinsic ones (social consequences), subjective ones (dependence), excessive intake, and addictive symptoms. For about 59 percent of those interviewed who reported any serious or "ever serious" drinking problem, the difficulties were confined to only one category. Most of those reporting

extrinsic problems (with the police, spouse, friends, and so forth) also revealed subjective problems and problems of excessive intake. Of those high on excessive intake, 49 percent reported no other problem. (The lack of other problems, however, may have been due to underreporting, the author said. Also, in past periods of excessive intake, these people may have been doing only what was customary in their group of associates.)

Preliminary results showed that groups relatively susceptible to problem drinking were men, the divorced, the low socioeconomic group, and the Irish. Knupfer pointed out, however, that there were two different types of relatively susceptible groups. In one type, the whole curve of intake was moved upward (in men, for example, as compared with women). In the second type, a high proportion of abstainers was found. Yet among those in the group who drank, a larger proportion fell into the highest intake group. A much higher proportion of persons in the lower socioeconomic group than in the higher had serious extrinsic problems. The proportion of abstainers was greater and the proportion of intake problems lower than in the higher socioeconomic group. The kinds of problems found relatively more often in the high socioeconomic group were excessive intake and dependence rather than extrinsic problems. The person of higher socioeconomic status was apparently more protected than the person of lower status against the consequences of high intake and dependence.

New Role of the NIMH In Drug Abuse Programs

A vigorous new Federal program to fight drug abuse and aid the nation's 60,000 addicts was outlined by Dr. James H. Fox, acting chief of the newly created Center for Studies of Narcotic and Drug Abuse of the National Institute of Mental Health, Public Health Service.

The new NIMH center, he said, will provide grants to stimulate research in the following areas:

- The basic causes of drug dependence and tolerance.
- The biological and behavioral effects of marihuana.
- The refinement of urine tests to detect the presence of opiates, amphetamines, and barbiturates, and the development of ways to detect the presence of marihuana and LSD in the body.
- The careful assessment of two new treatments for heroin addiction—methadone and cyclazocine—and the search for new ways to extend the action of cyclazocine from 24 hours to a week or more.

The center, Fox said, also will encourage research on new methods to rehabilitate addicts. For example, one current study is comparing the results of close supervision of opiate addicts during treatment by parole officers with results of a similar program run by social workers and public health nurses. Research efforts will be made to study and develop treatment techniques, now almost nonexistent, for the users of drugs other than the opiates, including LSD.

The NIMH Center for Studies of Narcotic and Drug Abuse has begun several large surveys of the use of drugs by the public, the author reported, including a study of LSD use by college students. It will provide funds to train doctors to treat drug abuse and will offer consultation to communities to set up drug treatment programs.

EPIDEMIOLOGY

Eradication by 1972 Of Venereal Disease

We are in the era of syphilis eradication, according to Dr. William J. Brown, chief of the Venereal Disease Branch of the Communicable Disease Center, Public Health Service, Atlanta, Ga. He predicted that syphilis can be eradicated from the United States by 1972.

Syphilis epidemiology has gone through a number of periods, the author noted. The first began, he said, with the introduction of darkfield microscopy, Wassermann testing, and arsenotherapy. Next came the period of short-term, inpatient therapy. The third period was characterized by the advent of refined epidemiologic techniques for venereal disease.

In the third period, epidemiologic results were evaluated principally by three indexes—the contact index (the average number of contacts per interview), the epidemiologic index (the average number of previously untreated cases discovered per patient interviewed), and the lesion-to-lesion index (the average number of infectious cases discovered per patient interviewed). The objective of this epidemiology, Brown pointed out, was to keep the incidence of these diseases at a control level.

Eradication represents the fourth period, said the author. In the present methodology, there has been a decline, he explained, in the importance of indexes relating to epidemiologic yield and an ascendancy of indexes related to prevention, based on a careful analysis of the individual case rather than the average of all cases. Eradication methods emphasize case prevention through rapid epidemiology and the epidemiologic treatment of contacts who might be incubating syphilis.

Set Control Measures For Coccidioidomycosis

Prevention of coccidioidomycosis is complicated by the fact that the causative organism is a natural and persistent inhabitant of the environment in endemic areas, reported Lawrence L. Schmelzer and Dr. Irving R. Tabershaw, both of the University of California, Berkeley. Thus, the importation of any susceptible labor force into such areas necessitates the employment of all possible dust control measures and the provision of a medical surveillance program.

Although dust control for prevention of coccidioidomycosis is not simple because of wide variations in exposures, Schmelzer and Tabershaw reported, general dust control meas-

ures can afford some degree of protection to persons in an endemic area. Oiling of parade grounds and barracks areas in military establishments has reduced the rate of infection as has planting of trees and lawns around residences and industrial plants. Filtering and conditioning of air in plants and offices has also been of some value, they said. Unfortunately, when exposure to dust is an inseparable part of an employee's job and working conditions preclude the effective use of respirators, protection to any realistic degree has been exceedingly difficult.

Schmelzer and Tabershaw asserted that skin testing for previous infection by *Coccidioides immitis*, the causative agent, is easy to perform, and all persons hired for work in endemic areas should be tested. Only immune workers should be assigned to operations involving known heavy exposures and, when possible, lifelong residents of the endemic areas should be hired, as their level of immunity is generally high.

Thyroid Cancer in Utah

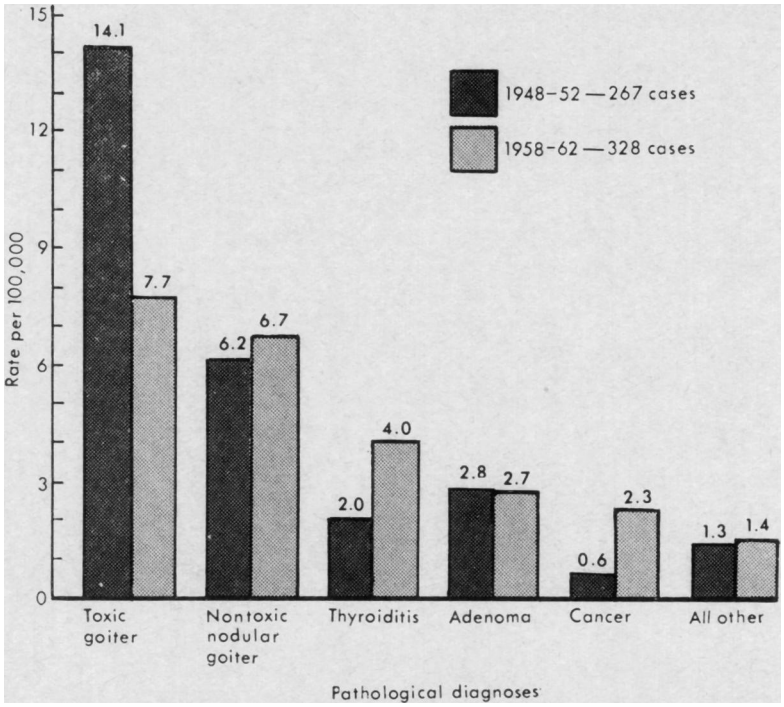
Thyroid cancer of increasing frequency in Utah and questions about possible effects of iodine 131 on the thyroid glands of Utah children have prompted studies seeking leads on the genetic or environmental factors associated with the increase.

Edward S. Weiss and co-workers of the Division of Radiological Health, Public Health Service, and the School of Hygiene and Public Health, Johns Hopkins University, collected hospital records of all thyroid surgery among Utah residents under the age of 30 for the period 1948–62.

For all thyroid diagnoses, there were about 60 surgical cases a year among women and girls and 10 per year among men and boys during the period. The average annual surgery rates, Weiss and co-workers reported, were 25 per 100,000 females and 5 per 100,000 males under age 30.

Cancer of the thyroid increased among females from an average annual rate of 0.6 per 100,000 in the period 1948–52 to a rate of 2.3 in the period 1958–62 (see figure). The reported incidence rate for thyroiditis doubled, the authors stated.

Average annual rates of thyroid surgery per 100,000 Utah females under age 30 for the periods 1948–52 and 1958–62



Surgery for toxic goiter, the most frequent diagnosis, decreased by about 50 percent in the 15-year period. No change was evident for nontoxic nodular goiter, adenoma, and for miscellaneous not-elsewhere-classified diagnoses.

Community Hospitals Watch For Nosocomial Infections

Seven community hospitals recently participated for almost a year in a study to determine the simplest and most effective methods of surveillance of nosocomial infections of varying etiology. Dr. Theodore C. Eickhoff and co-authors of the Communicable Disease Center, Public Health Service, provided a progress report on the study.

Among 63,873 patients, 936 nosocomial infections were reported—a mean of 1.5 percent. The rates in individual hospitals varied, the authors said, from a low of 0.5 percent to a high of 2.7 percent. The infections were classified in broad categories as wound infections, urinary tract infections, respiratory tract infections, infections of the skin and subcutaneous tissues, and as infections of other sites. The last category included septicemia, meningitis, deep abscesses, peritonitis, empyema, and others not readily classified in other categories. More than one-third of all reported infections involved the urinary tract, followed in decreasing frequency by wound infections, infections at other sites, respiratory tract infections, and infections of the skin and subcutaneous tissues.

The mean nosocomial infection rate was highest on surgical services—2.2 percent, followed in decreasing order by the obstetrical and newborn services rate—1.2 percent, and the medical services rate—0.7 percent. The authors reported that no seasonal trend was apparent.

Although coagulase-positive staphylococci were the organisms most frequently isolated, Eickhoff and associates noted that they accounted for only 23.3 percent of the infections for which bacteriological data were available. Coagulase-negative staphylococci were recovered from an additional 4.5 percent of the patients with nosocomial infections.

The Enterobacteriaceae (including *Escherichia coli*, the *Klebsiella-Aerobacter* group, the proteus species, and paracolon bacteria, plus *Pseudomonas aeruginosa*) were recovered from 63.5 percent of the patients with infections for which there were supporting bacteriological data. These organisms were recovered most frequently from patients with infections of the urinary tract, the authors reported.

Prevalence surveys that were carried out simultaneously indicated that the surveillance programs in the different hospitals varied in effectiveness from 10 to 83 percent, with a mean effectiveness of 43 percent.

School Child Often Carries Hemolytic Streptococci

Hemolytic streptococcus is apparently a common inhabitant of the pharynx of children during their first 5 years of school life but seems to account for only a small percentage of the numerous respiratory infections such children have. Therefore one should not jump to the conclusion that a school child has a streptococcal infection just because the throat culture is positive for hemolytic streptococci. False assumptions as to the cause of these infections can, and do, lead to much unnecessary treatment of them with antibiotics.

Dr. Robert W. Quinn of the Vanderbilt University School of Medicine, Nashville, Tenn., expressed these views in presenting results of some phases of a study of hemolytic streptococcus in children in four Nashville schools. Three of the schools were selected at random from those serving high, middle, and low socioeconomic areas in Nashville; a fourth school serving an entirely Negro neighborhood was also selected. In a 5-year period (1961–66), 469 children were observed, but results presented were only on the 204 children who were in the study for the entire period.

The role of the hemolytic streptococcus in upper respiratory infections and in the pathogenesis of rheumatic fever and glomerulonephritis is widely recognized, Quinn pointed out. Less well known, he said, is the natural occurrence of these bacteria in children. Long-term studies are needed, he explained, to determine the incidence of upper respiratory infections due to the hemolytic streptococcus and the incidence and significance of the carrier state during the ages when streptococcal infections, rheumatic fever, and glomerulonephritis occur most frequently.

Carrier rates for hemolytic streptococci varied a great deal from year to year in the four schools, Quinn reported. The highest carrier rates were seen in the two lowest socioeconomic groups of children—one Negro group (20 percent) and one white (22 percent). The lowest carrier rates (10 percent) were observed in children of the middle socioeconomic group. The rates of children in the high socioeconomic groups were 13 percent. Cumulative carrier rates were highest in the third and fourth years of the study, lowest in the first and fifth years.

Only slight seasonal trends in carrier rates were noted, Quinn stated. There was a small increase in the autumn, followed by a decline and then a gradual rise until the highest rates were reached in March and April; then a gradual decrease occurred in three of the four study groups. The experience of each child was different from the others in respect to the carrier status and the occurrence of respiratory infections, Quinn commented.

In one school year, 85 percent or more of the children in the two low socioeconomic schools were found to be carriers of hemolytic streptococci. A throat culture positive for hemolytic streptococci was found in at least 1 of 5 cultures in children of two schools, in 1 of 10 cultures in the third school, and in 1 of 8 in the fourth school. Yet, Quinn emphasized, it was possible to establish the hemolytic streptococcus as the etiologic agent in only a small percentage of children—probably less than 4 percent.

Results of the Nashville studies and several others indicate, said the author, that the hemolytic streptococcus is much less frequently the cause of respiratory infections in young school children than viral agents. One is left with the impression, he noted, that the diagnosis of streptococcal infection must be based on the historical, clinical, bacteriological, and seriologic results and—in the case of epidemics—on epidemiologic information. The serologic results are not likely to be of much help in a busy practice where time is important.

Electronic Data Processing To Detect Hospital Epidemic

Col. Joseph D. Mountain (USAF, retired) and associates at Cornell University Medical College, New York City, described what they termed as "a first attempt to utilize the facilities of electronic data processing equipment to improve detection and early warning of possible inhospital epidemics." Computer programs have been written and tested for two classes of algorithms, they said, and it is estimated they will be put into experimental operation in the New York Hospital–Cornell Medical Center in early 1967.

Some hospitals, the authors commented, have manually maintained reporting systems which exploit the methods of data collection and analysis available to them. Manual reporting systems, however, they said, are seriously restricted by the magnitude of the clerical bookkeeping required and by the alertness to rare occurrence that such systems demand of an already busy staff.

The electronic data processing system which will be used in the study of the various problems of surveillance, detection, and reporting of possible epidemics at the New York Hospital–Cornell Medical Center consists of a central automatic electronic computer, one or more teleprinters located at strategic points in the hospital and connected to the central computer via the teletype exchange, plus forms, programs, and procedures for use with the equipment.

The heart of the system, according to Mountain and associates, is the collection of programs which direct tabulation, analysis, and reporting. These programs are gen-

erally of the bookkeeping or the watchdog type. In the bookkeeping type, information is processed concerning a disease—such as hepatitis or pneumonia—whose incidence is important. The disease is frequently present in the hospital. The requirement laid on the system is to determine continuously whether the current incidence is due to chance alone or whether it is increasing or is beyond normal limits. A weighted moving average of the incidence of the specific disease is maintained, and a forecast with warning limits of the expected value of the variable is calculated at prescribed intervals.

Some diseases or infections appear only at rare intervals, and every case must be reported, the authors pointed out. Smallpox and rabies cases are examples. This situation is usually well handled under any surveillance system, they noted, although the computer may provide a slightly faster and more reliable response than will a manual system. In other situations, such as meningococcal meningitis, the frequency of occurrence is sufficiently great to reduce the staff's index of suspicion to the point that an epidemic may develop before they are alerted. In these situations, the authors stated, a central reporting system maintained by electronic data processing will improve the speed and reliability of reporting of cases and the identification of a hazardous condition by reducing the uncertainties and delays of informal reporting.

Characteristics in Youth That Predispose to Stroke

Cigarette smoking, higher blood pressure, increased body weight, shorter body stature, early parental death, heart consciousness (sensation of rapid, slow, or irregular heart beating), and nonparticipation in varsity athletics apparently can predispose college students to fatal stroke in later years.

Dr. Ralph S. Paffenbarger, Jr., and co-workers from the Field Epidemiological Research Section, National Heart Institute, Public Health Service, and Harvard University School of Public Health, Boston, reported that 171 stroke decedents were identified among 50,000 male former students who entered the University of Pennsylvania or Harvard University between 1916 and 1950. For each decedent, four control subjects were chosen at random from his surviving classmates of equivalent age.

Characteristics	*Percent of decedents* (N=158–171)	*Percent of controls* (N=615–684)
Cigarette smokers	45. 0	31. 3
10+ per day	20. 9	11. 2
Systolic blood pressure:		
130+	45. 0	31. 3
150+	5. 9	3. 4
Diastolic blood pressure:		
90+	17. 8	12. 5
100+	5. 3	4. 0
Height less than 68 inches	32. 9	27. 5
Ponderal index (height/$\sqrt[3]{\text{weight}}$) less than 12.9	32. 4	24. 2
Parent dead from any cause	25. 9	17. 1
Cardiovascular-renal cause	11. 7	3. 8
Heart consciousness	41. 9	21. 7
Varsity athlete	7. 0	15. 5

Comparison of case-taking and other college records of decedent and control groups revealed a number of differences in the decedents and the control group (see table).

Combinations of precursive elements further increased the risk of fatal stroke, the authors pointed out, particularly heavy smoking and a higher level of blood pressure occurring together or with other elements. Although the mode of action of early precursors is unknown, they said, it is remarkable that persons in young adulthood can be differentiated by characteristics related to fatal stroke that occurs some 30 or more years later.

Use in the study of independent and consistent data recorded years ago offered the special advantage of telescoping time into manageable units, said the authors. More important, observations were used that had been recorded during the subjects' youth—a time of preclinical pathogenesis of hypertension and atherosclerosis.

Significance of Viruses In Cases of Diarrhea

All types of viruses except two were found more frequently in fecal specimens from children with diarrhea than from control subjects in a recent study of enteric viruses and bacteria. Dr. Melvin H. Goodwin, Jr., and associates, Phoenix (Arizona) Field Station, Communicable Disease Center, Public Health Service, conducted the study.

Fecal specimens from 438 children hospitalized because of diarrhea and from 318 children without diarrhea, who were matched to the first group as closely as possible by sex and age, were compared. The authors reported that laboratory examinations revealed the following percent of specimens with pathogens from patients and controls, respectively: *Shigella*—23.5 and 0, *Salmonella*—3.7 and 2.2, *Escherichia coli*—30.6 and 6.9, adenovirus—2.5 and 0, Coxsackie virus—3 and 0.9, ECHO virus—11.9 and 4.4, poliovirus—2.5 and 6.9. The poliovirus, they said, probably came from vaccine.

In infants, who comprised about 78 percent of the cases studied, *Shigella* was associated with diarrhea in about 15 percent, and *E. coli* was associated with diarrhea in about 37 percent. *E. coli* was not recovered from children more than 2 years of age, but *Shigella* was relatively more prevalent in this group than among younger children.

Status of Shigellosis In the United States

Almost 19,000 isolations of shigellae have been made in the United States since the fall of 1963, according to a paper by Dr. Edward R. Eichner and associates of the Communicable Disease Center, Public Health Service.

Two-thirds of these isolations have been from specimens of children

under age 10, the authors said. *Shigella sonnei* and *Shigella flexneri 2* accounted for more than 60 percent of the isolates. *S. flexneri* accounted for two-thirds of all isolates in the South, but less than half of those in the North.

The peak incidence of shigellosis is in late summer, the authors reported. Shigellosis is endemic in certain medical institutions, Indian reservations, and lower socioeconomic communities. An effective oral vaccine, they said, could facilitate control in confined groups.

The authors noted that nonhuman sources of shigellosis include specimens from primates and fowl products.

The Navajo's Way of Life Exposes Them to Plague

Cultural and socioeconomic factors associated with the Navajo Indians' way of life enhance their risk of getting bubonic plague from fleas or directly from the wild animals they infest, according to evidence obtained in a study of a 1965 epidemic of plague in McKinley County, N. Mex.

Dr. L. Kartman and associates from the San Francisco Field Station, Communicable Disease Center, Public Health Service, pointed out that the Navajo not only lives close to wild animals but he traditionally uses many of these, particularly rabbits and prairie dogs, as food. The intimate association of Navajos with prairie dogs and other mammals is not limited solely to their use as food. The authors stated that evidence was also obtained that Navajo children trap prairie dogs as a form of play and that instances of children handling "pet" prairie dogs were noted.

Another factor noted was that domestic dogs were poorly fed and therefore forced to forage for food. They frequently bring back dead animals to the area of the home. Thus, the authors suggested, the dogs on the reservation may possibly act as a bridge between infected mammals, their fleas, and man.

Epizootics among prairie dogs in New Mexico in 1965 were clearly related to cases of plague among Indians, the authors said. The epizootics continued in 1966. Specimens of prairie dogs found dead, fleas from prairie dog burrows, and some fleas from field mice were shown to be infected with *Pasteurella pestis*. A cottontail rabbit, *Sylvilagus nuttallii*, was found dead from plague within the limits of a prairie dog colony undergoing an epizootic.

Serologic tests showed that domestic dogs associated with human cases of plague had significant *P. pestis* antibody titers. Other canines in the area also showed positive serology, the authors stated.

The authors concluded that although the observed cases of plague among the Navajos did not have a familial character or show the clustering associated with family infections, the cases of plague were nevertheless community oriented, based on cultural and socioeconomic factors. Thus, they added, the 1965 plague cases can be thought of as constituting a community cluster. If this characteristic is borne out by additional studies, the authors feel that much weight will be added to the hypothesis that the Navajo community presents a special epidemiologic framework in relation to wild rodent plague that sets it apart from the usual epidemiologic situations that have become well recognized in the United States.

Sickle Cell Trait And Blood Pressure

Negroes, with great consistency, exhibit the highest blood pressures of racial groups at almost all ages and, after puberty, in both sexes, commented Dr. A. Rossi-Espagnet of the Department of Tropical Medicine and Public Health, Tulane University School of Medicine, New Orleans, and associates. Negroes also exhibit higher and earlier mortality due to hypertensive heart disease and cerebrovascular accidents. In disparate geographic locations, they display similar blood pressures, and these pressures are invariably higher than those of other racial groups living in the same area, the authors said.

If a factor which is present mainly in Negroes is associated with higher blood pressures, suggested the authors, possibly some or all of the differences in racial groups could be explained. Such a factor, they noted, is likely to be genetic. The sickle cell trait could be one such factor because it is mainly present in Negroes at variable levels of prevalence, it is genetically transmitted, and it is associated with a variety of renal abnormalities. At least one such abnormality, said Rossi-Espagnet and co-authors, is known to be associated with hypertension. Therefore, on a working hypothesis that there might be an association between sickle cell trait and blood pressure, a preliminary investigation was carried out to test this hypothesis in the field.

The study was conducted in Louisiana and in Colombia, South America, at the same time. A total of 3,538 Negroes 20 years or older were examined. Blood pressure was measured to the nearest 2 mm. Hg.

The data, reported Rossi-Espagnet and associates, did not show a clear relationship between sickle cell trait and systolic or diastolic blood pressures in either sex. This result, they commented, may be because such an association does not exist or because they were unable to select and study a suitable population. The overall prevalence rate of the sickle cell trait in the study population was 9.6 percent for men and 9.5 percent for women. The prevalence increased with age in men. The distribution of mean blood pressures by age and sex was similar, the authors stated, in both the sickle cell positive and negative groups of all populations considered.

Communitywide Prophylaxis Effective with Isoniazid

Reports on recent communitywide programs of isoniazid prophylaxis in Boston, Mass., and in Alaska demonstrated that this method of tuberculosis control is effective in heavily infected populations.

No appearance or reappearance of clinically active tuberculosis has been observed in any patient participating in the Boston isoniazid prophylaxis program, according to Dr. Samuel Clive Cohen, director of

tuberculosis clinics of the Boston Health and Hospitals Department, and Dr. Leonard I. Steinfeld of the Tuberculosis Branch, Communicable Disease Center, Public Health Service.

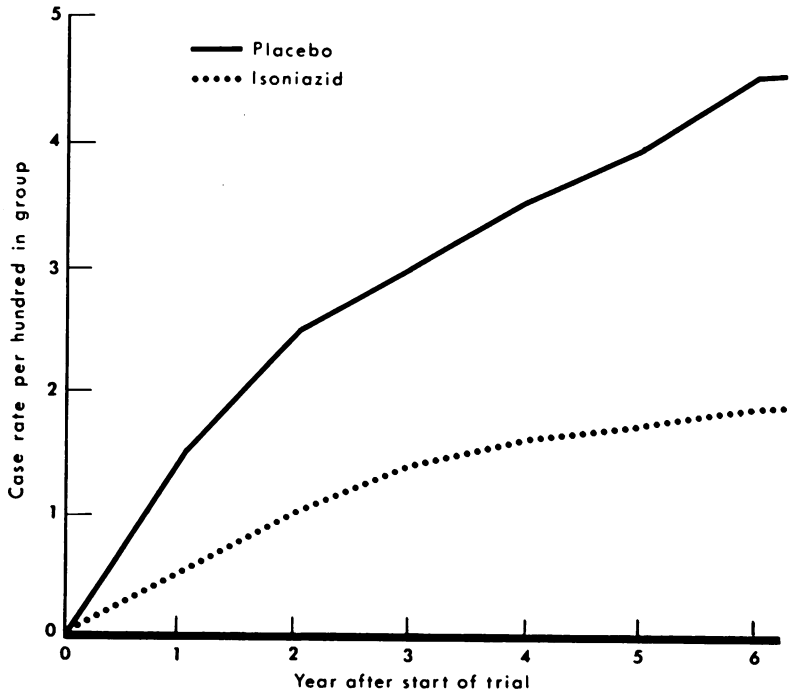
Mrs. Laurel Hammes of the Arctic Health Research Center, Anchorage, Alaska, and co-authors from the Johns Hopkins University School of Hygiene and Public Health and the Communicable Disease Center, Public Health Service, presented evidence of the public health usefulness of isoniazid prophylaxis in the Bethel area of Alaska from both the humanitarian and the financial point of view.

The Alaska Program

Tuberculin testing in Alaska from 1949 to 1952 had shown "fantastically high levels of tuberculous infections," particularly in the Bethel area, said Hammes and co-authors. Shortly thereafter a crash program was instituted to bring modern tuberculosis control methods to Alaska. By 1957, the situation had shown improvement. Even so, the authors noted, the annual infection rate in the Bethel area was 8 percent, and newly reported active cases equaled 1 percent of the population for that year. A controlled communitywide trial of isoniazid prophylaxis was therefore instituted in the Bethel area. The program was sponsored and conducted by the Public Health Service and the Alaska Department of Health and Welfare.

The Alaska trial was restricted to 30 communities, with a population of almost 7,300 persons, almost all Eskimos. Results of tests in 1957 showed that nearly everyone in the 30 communities had been infected with tubercle bacilli by the age of 15. The initial step was an explanation of the trial to each community. Following approval by each council and a village meeting, a house-to-house census was conducted. Half of the households were supplied isoniazid tablets for a year; the other half, placebo. Less than 3 percent of the people refused to participate. The tuberculosis experience of the participants has now been analyzed up to the date of their examination during the winter of 1963–64, the authors reported.

Cumulative tuberculosis case rates by year after entry in isoniazid program, Bethel area of Alaska, 1958–64



Note: Rates are for both new and reactivated tuberculosis.

The isoniazid group not only fared better than the placebo group during the year of medication (see chart), it also continued to fare better throughout the entire study period of approximately 6 years, Hammes and her associates emphasized. After the first 4 years, they said, only 8 cases of active tuberculosis occurred among the isoniazid group, contrasted with 33 among those who took placebo.

Some of the study participants took 80 percent or more of the recommended dosage over the year, but others did rather poorly. Yet, the authors pointed out, the striking result is that at all levels of taking medication, the isoniazid group had less tuberculosis. Even a little isoniazid, they said, is apparently better than none at all. The difference between the isoniazid and placebo groups is greatest for those who took medication best. There is a suggestion, however, commented the authors, "that 6 months of treatment might be enough." Further studies on larger populations would be needed to confirm this suggestion, they cautioned.

The Boston Program

In contrast, Cohen and Steinfeld reported that in Boston the period of isoniazid prophylaxis for positive tuberculin reactors had been extended about 5 years ago from 1 to 2 years. The reasoning, they explained, was that if 1 year of therapy had an advantageous effect on dormant foci of infection, 2 years would have an even greater effect. Also, in the Boston program, dosage is nearly twice as large as in Public Health Service isoniazid programs. The authors pointed out that they have yet to report the appearance of a single case of active tuberculosis in the Boston group in either the medication years or afterwards. This result, they noted, contrasts with the experience in some of the Public Health Service trials.

The Boston program accepts all children with positive reactions on tuberculin tests. Currently, said the authors, 1,000 children are participating or have completed their course of therapy. The authors' analysis was based on the 442

patients who had completed their treatment.

Eighty-three percent of the 442 patients had initial chest X-rays that were interpreted as showing no significant results. Twenty-two percent showed evidence of primary disease on chest X-ray while under supervision. The median skin test size reaction for those with X-ray evidence of primary disease, Cohen and Steinfeld found, was 20 mm.; for those with negative X-ray results, 15 mm.

Authors' Conclusions

Isoniazid, commented Cohen and Steinfeld, has not only reduced the expected incidence of tuberculosis among patients while they are taking medication, it also seems to have some lasting effectiveness, since "we have not seen reactions of the disease in subsequent years."

Hammes and her co-authors estimated that a communitywide program of isoniazid prophylaxis in the Alaska study population (without any control subjects) would have reduced potential cases by 174—55 percent fewer cases would have occurred than without such a program. Prevention of 174 cases would have required the services of 5 nurses and 2 clerks for 2½ years. For each year of personnel time expended during the program, 10 cases were prevented. Since patients with tuberculosis were hospitalized on the average about 10 months, the authors said, each year of personnel time saved 100 months of hospitalization.

HEALTH EDUCATION

If Your Health Is Good You Want the News

Findings of a study on characteristics distinguishing people who seek health information in the mass media differ considerably for broadcasting and the printed media, reported Dr. James W. Swinehart, research associate and lecturer, University of Michigan School of Public Health. Significant differences in sex, race, and education appeared in the data from a national survey, one of three studies concerned with voluntary exposure to health communications.

Women reported reading about health more often than men, he said, but the sexes listened to health programs on radio and television with almost identical frequency. White persons and the better educated reported more frequent reading about health. Nonwhite persons and the less educated reported more frequent use of the broadcast media to learn about health.

A classification of reported income produced no significant differences in extent of reading or listening, although an income-related question produced differences consistent with the findings on race and education. When asked how much difficulty they would have in paying a large medical bill, those who said they would have a great deal of difficulty reported significantly less frequent reading and significantly more listening, he said.

The assumption that health information in the mass media does not reach those who need it most has been based largely on inferences from demographic data. To test this assumption more directly, Swinehart compared three indexes of factual knowledge with the reported use of the media as a source of health information. He grouped the respondents according to the number of symptoms they could name of poliomyelitis, tuberculosis, and diabetes.

For the printed media, the findings supported the select-audience assumption in all three cases. The more symptoms named, the more frequently the health content of magazines and newspapers had been read. Significant differences, however, did not appear for any of the three in the use of radio and television — again suggesting that a selective bias does not operate in these media. The results were essentially the same when education was controlled, he stated.

A lack of knowledge of health is only one indicator of possible unmet health needs, Swinehart remarked; therefore, he analyzed several other indicators in relation to frequency of reading and listening to television and radio. Generally, he said, more frequently reading about health was reported by people who thought their health was good or excellent, those who had a physical examination regularly rather than occasionally, and those who did not fear the outcome of a visit to a physician. Persons who obtained regular physical examinations also were more likely to report frequent listening to health programs.

Swinehart found a number of factors of presumed importance to be unrelated to frequency of reading or listening. Among these were other indexes of unmet health needs, medical care experience, importance of health to one's usual activities, and attitudes toward the medical profession. Some of these negative findings, he said, may suggest changes in the themes frequently used in health communications and are currently being explored with different combinations of characteristics as control variables.

Folk Use of Medications Studied at Stanford

The Stanford Research Institute, Menlo Park, Calif., has studied a part of the folk-professional boundary in a middle-class community as it concerns the use of medications. The professional use of medicines has been delineated, said Dr. James G. Roney, Jr., director of health planning research at the institute, and Mrs. M. L. Nall, graduate student, but how adult members of a society deal with health care and medications on their own is not so well understood.

The researchers selected 237 households from a 10-percent sample of a city directory; 86 household groups completed the study. The households included 170 men and 174 women who were younger and had larger households and a higher educational level than the total population. An adult member of the household, usually a woman, was asked to keep a purchase record of medications for a 2-week period and to list all the

medications on hand in the household and was interviewed about the household and its medication practices.

Of the 86 households, Roney and Nall reported, 61 acquired 154 medications during the 2-week period, including 40 prescription medicines. Pharmacies supplied 103 medications, supermarkets 19, discount stores 6, physician samples 4, medical clinics 5, department stores 3, and other sources 14.

Individual households acquired 0 to 12 medications within the 2-week period. Seven respondents indicated that they borrowed medications from neighbors or relatives, and nine prepared homemade remedies including honey, lemon, and hot water for colds and coughs; gelatin and water to prevent menorrhagia; and witch hazel and salt or boiled California oak for poison oak dermatitis.

When interviewed, the 86 household groups had 2,539 medications on hand, ranging from 3 to 88 per household, or a mean of 29.5. Of these, 445 were prescriptions, of which 346 had labels identifying the medication. Most respondents could not remember how long the medications had been kept. Some discarded the medications immediately after using them for the condition for which they were purchased; some kept the medications as long as 20 years and even moved them along with household goods when the families relocated, the investigators said. The medications were stored in medicine and kitchen cabinets, bureau drawers, nightstands, knitting baskets, purses, and coat pockets.

The 2,539 medications were used for 2,623 conditions—categorized according to the use stated by the respondents. Some medications were used for more than one condition. The leading uses were for skin conditions, respiratory problems, and gastrointestinal ailments. Only one-fourth of the medications were physician advised, the authors stated; most were self-determined.

Sources of advice varied with category of use of medication and with educational level of head of household. Cardiovascular, genitourinary, and half of the systemic ailments were dealt with largely through physician-advised medications. The pharmacist often gave advice on eye troubles. Self-advice decreased with less than college to college level, and increased for the postgraduate group.

About four-tenths of the medications were for family use, and less than one-third for specific persons. Sons and daughters used about equal amounts of specific medications, while wives used nearly twice as many medications as husbands.

Preparations for systemic ailments were used three times more frequently by wives than husbands and twice as frequently by sons as daughters. Eye medications were used four times as much by husbands as by wives. Cardiovascular medications were fairly equally divided between husbands and wives; genitourinary medications were mostly for wives.

One-fourth of nutritional supplements were for family use. Nearly 70 percent of metabolic-disorder drugs were for wives. Most fever preparations were for the children. Half of the remedies for nervousness were for wives, and more than half of the headache remedies for family use. Upper respiratory preparations were primarily for family use, and most ear medications were for the children. Preparations for indigestion, diarrhea, and constipation were most often for family use. Husbands were second most common users of indigestion remedies, and wives second most common users of constipation remedies. Sons used most of the poison oak remedies.

Because of the shortage of health manpower and the increased public knowledge about health matters, individual persons may gradually assume more responsibility for the health care of themselves and their families, Roney and Nall stated. A movement in this direction is evident, they said, but careful planning is needed to guide this changing division of labor. Such a changing relationship has implications for modification of education programs for the health professions, increased education programs for the public, legislation controlling retail purchases of health products and financing of medical care, and development, manufacture, and marketing of health-related products and services.

Group Discussions Change Teenagers' Attitudes

In two studies of teenage drinking, 75 percent of the 16-year-olds who drank reported that they had permission to drink at home, according to Lena M. DiCicco and co-workers, Massachusetts Department of Public Health, division of alcoholism, Boston. Surveys reveal that the majority of teenage drinkers often start under parental supervision at ages 13 and 14. Young people, the researchers continued, follow adult models in their drinking practices.

Stemming from an invitation extended by the principal of a private high school in the Boston suburbs, the DiCicco group conducted a program to see whether small group discussions led by trained teaching staff could have any effect on changing the attitudes of students toward drinking and drunkenness.

The program was a test of the division's preventive approach to alcoholism; that is, allowing young people to examine their own attitudes and practices in relation to drinking and to define responsible behavior for themselves as individuals. Because the danger for young people is not alcoholism but intoxication, the goal of the educational program was to prevent irresponsible or excessive use of alcohol.

All junior students in the high school were randomly assigned to experimental groups (small groups to discuss drinking) or control groups (small groups to discuss other topics such as Vietnam, civil rights, or birth control). There were 12 alcohol discussion groups and 10 control discussion groups, with an average of 9 students in a group. The groups met for one period (40 minutes) each day for 5 consecutive days.

The students were requested to fill out 10-minute questionnaires on drinking before the program began, at the end of the program, and 1 month after the program was completed. Evaluation of the program was achieved from these question-

naires. Two Likert scales were used: The responsible use scale and the irresponsible use or drunkenness scale. Both scales were found to be satisfactory.

The following items are in the responsible use scale, with which the subjects were asked to agree or disagree:

1. Alcohol used in moderation can be an important contribution to social relationships.

2. The use of alcohol is a custom which should be abandoned in our society.

Items in the irresponsible use or drunkenness scale include the following statements:

1. A person who has never been tight or drunk is really missing a good thing.

2. Getting drunk for kicks is part of growing up.

Forty-two items comprised the attitude scales. The questionnaire also included 17 items concerning alcohol and alcoholism.

High scores on the responsible use scale indicate that the respondent is tolerant of moderate (responsible) use of alcohol—not necessarily that he thinks he should drink or that everybody should drink but that he recognizes there is such a thing as responsible drinking and does not condemn people who drink in this manner. High scores on the irresponsible use or drunkenness scale indicate that the respondent thinks excessive drinking or drunkenness is all right. The aim of the program, DiCicco said, was to increase scores on the responsible use scale and to decrease scores on the drunkenness scale.

The data indicate that the program was successful in changing the attitudes of the students. In the alcohol groups there were statistically significant increases in scores on responsible use of alcohol between the pretest and the first post-test and an almost statistically significant decrease on irresponsible use. Control groups showed no changes. The changes for the alcohol-discussion groups held up in the second post-test given 1 month after the program. Significant changes in knowledge took place in the experimental groups and no changes in the control groups—as measured by both post-tests.

The State department group said they knew they were operating under ideal laboratory conditions for the program—perhaps difficult if not impossible to replicate in the average classroom—however, the results convinced them that it is possible to change attitudes of the average teenager toward excessive drinking.

Much conflict centering on youth and drinking, they said, stems from the lack of consensus as to when these persons "come of age." The use of alcohol is so much a part of the fabric of our society, they continued, that the only approach to alcohol education which has any chance of success is one in which young people have the opportunity to think through their own attitudes toward the use of alcohol.

Teenagers Volunteer Help In Clinic Project

Teenagers on the west side of San Francisco voluntarily participated as health workers in a Westside District Health Center project to test and compare the effectiveness of selected community leaders as channels of communication in motivating mothers in low socioeconomic communities to participate in a program for screening the vision and hearing of 3- to 5-year-old children.

It is important that these young people, future parents, understand and learn to use the resources of the preventive medical services of the health department, stated Sandra Hellman, coordinator of the project, Urban Life Institute, University of San Francisco.

Three noncontiguous community areas were selected, approximately 10 square blocks each, based on similar population characteristics. The volunteer health workers were 17 eighth graders from the local junior high school in area 1; 8 mothers (12 had volunteered) from a neighborhood community center in area 2; and 28 neighborhood church people, lay and ministerial, in area 3. Every home in each of the three 10-square-block areas was visited, in an attempt to seek out all 3-, 4-, and 5-year olds living in the area.

Each group assumed responsibility for planning, setting up, and conducting the program, with consultation and supervision from Hellman. They were given an area assignment, advised of the importance of screening the preschoolers' vision and hearing, asked to decide what method of contact and motivation would be most effective, and then told to carry out their plans. It was Hellman's intention to allow as much freedom as possible in the method of seeking the most effective communication to motivate the mothers of these children to use the health service. The area volunteers decided that the mothers of the preschoolers should be contacted face to face.

In the project year 1962 there were approximately 320 children in 1,137 households in area 1 who were 3, 4, and 5 years old, 123 in 744 households in area 2, and 214 in 846 households in area 3. The number of children found at home in area 1 was 98, in area 2, 67, and in area 3, 141.

Despite great effort, the percentage of total response was only 12 percent in area 1, about 15 percent in area 2, and 9 percent in area 3. The teenagers' greatest problem was their lack of time to make contacts. Few mothers were found at home when they were able to visit, between 3 p.m. and 5 p.m. The volunteer group in area 2, however, considered the project a personal success for them as evidenced by the 29 extra children one committee member recruited. In area 3, unfortunately, the church appeared to have little influence in motivating mothers to attend the clinics. Of the 320 children in area 1, a total of 37 attended the clinic; 19 of 123 attended in area 2, and 19 of 214 in area 3.

Although the overall response to this screening project was not good, Hellman said, similar projects should be continued, as they serve to introduce preventive medicine in low socioeconomic communities, and the percentage of participation is likely to increase with familiarity and could reach the participation level of a middle-class community.

Hellman stated that the work of

the teenagers brought about a great deal of good will and pride among the citizens of the community.

The greatest single problem in the project was finding the target audience, the mothers of the preschool children, Hellman reported.

School Guidance Counselors Lack Health Career Facts

A limited survey by the United Hospital Fund of New York indicated that high school guidance counselors lack information about health careers, said Daniel S. Schechter, director, division of education, American Hospital Association, Chicago.

When asked if they had sufficient information in their files on health careers to feel competent in counseling their students, 73 percent answered "Yes" for registered nurse and 50 percent for dietitian but only 38 percent for physical therapist, 31 percent for hospital administrator, 30 percent for social worker, and 1 percent for electroencephalogram and electrocardiogram technicians.

When asked if their students expressed any reluctance to enter careers in the health field, 34 percent said "Yes," giving as reasons (*a*) poor salaries, (*b*) poor working conditions, and (*c*) low status—except for physician.

Somehow, Schechter, said, our services to young people must be improved to help them understand the structure of health occupations and the methods of qualifying for various positions. Hospitals and other health agencies must join with school systems to improve the adolescent understanding of the "world of work," he asserted.

Hospital Patients Want Their Questions Answered

Hospital patients facing discharge, and their families, usually have questions about diet, medication, treatment, exercise, and return to full activity. Based on this premise, the Medical Foundation, Inc., Boston, asked the collaboration of a 250-bed hospital in suburban Boston in a research project to learn if patients had questions when leaving the hospital and, if so, what they were.

After interviewing 108 patients in an exploratory phase of this study, Allen D. Spiegel, health education associate at the Medical Foundation, and associates developed a 44-item personal interview schedule. The first 12 questions dealt with ethnic, social, and educational factors; the next 8 probed the patient's knowledge of his illness; 5 related to the patient's knowledge at admission, and 19 to his knowledge at discharge. After the final interview, and a coding procedure had been developed, every third medical and surgical patient and every sixth obstetrical patient admitted during an 8-month period was interviewed. Only 50 obstetrical patients were interviewed because of the similarity of answers. Biographical data also were collected from 500 patients who were "tagged" but not interviewed, allowing the investigator to determine whether he had a representative interview sample. Liaison and advisory committees also worked with the researchers.

More than 3,000 questions and comments were offered in 17 categories: activity, diagnosis, reasons why patients did not ask questions, symptoms, suggestions, treatments, prognosis, medicines, operation, personal care, diet, personal problems, nursing care and nurses, miscellaneous items, finances, marital relations, and tests.

The patients indicated that they wanted an opportunity to communicate with their physicians other than during the usual "rounds," which they apparently disliked. They wished privacy away from the wards, especially when they had personal questions or when the physician talked to them about their condition. They desired simplicity in answers, with less medical terminology. They wanted more explanation of what was done to them and why, what to expect after their operation or treatment, better communication between their physician and family, and more information about their discharge. They wanted to know the approximate date they should arrange for transportation, husband's work, babysitters, household help, and finances. They wanted the physician to sit down and talk with them, if only for a short time.

After tabulating the replies, the liaison committee recommended that a checklist for discharge instructions be included in the patient's chart, including items on diagnosis, prognosis, activities, treatments, medication, tests, diet, disposition of the patient, and evaluation of his level of knowledge. Each attending physician was advised to mark the specific items in each category as they were answered and to keep the facts listed on the patient's chart. In theory, this allowed the physician to make sure that he had covered most of the major areas where the patient required information. This checklist is still being used, but it has not been widely accepted in the other hospitals, the researchers said.

The liaison committee also prepared and the advisory committee approved recommendations to facilitate a patient-education program. They agreed that the responsibility for education must emanate from the physician, shared by and delegated in part to staff residents, using their full capacities through planned patient-oriented education programs.

Sixty-five percent of the patients said they were not given specific instructions about posthospital care when leaving the hospital, 64.1 percent said they were not given time for instruction, 16.7 percent said they were given 1 to 5 minutes of instruction, and 17.4 percent said they were given more than 5 minutes of instruction. About 75 percent thought it was easy to get answers to their questions, according to the researchers.

The committee made these recommendations to help inform patients:

1. Establishment and evaluation of a discharge office for patients and their families to insure that the educational component of medical care was being met.

2. A list of common questions and answers that all the physicians agree is suitable for distribution.

3. Libraries containing literature in layman's language on a wide assortment of health and medical subjects, including programed reading

materials and devices, films, and other audiovisual equipment for effectively delivering a message.

4. Pads and pencils at the bedside to encourage patients to write their questions, later to be answered by staff members.

The educational component of the patient's medical care could be made part of a total package, said Spiegel and co-workers.

Counseling of Primiparas Tried Via Television

A study (*a*) to determine the effectiveness of television as a means of providing anticipatory counseling to groups of primiparas during the immediate postpartum period and (*b*) to measure the relation of maternal attitudes and certain other factors to the mother's perception of problems in caring for her child was reported by Dr. Elsie R. Broussard, teaching fellow in child psychiatry, University of Pittsburgh School of Medicine.

A total of 318 primiparas were interviewed soon after delivery and again at the end of the neonatal period so as to compare data obtained at two points in time.

Broussard devised the "average baby" and "my baby perception" inventories which provided a measurement of the mother's perception of her infant as compared with the average infant. The "degree-of-bother" inventory was designed to measure problems in infant behavior. Schaefer's postnatal research inventory and the mothers' psychosomatic anxiety-symptom scale were used to measure maternal attitudes.

Three television programs dealing with the mothers' feelings, concerns, and details of baby care were written, directed, and produced by Broussard and put on video tape. To provide a control group, the television counseling was shown to some primiparas and not to others.

The number of mothers among those attending the televised counseling sessions who rated their babies as better than average increased significantly ($P<0.05$) from the immediate post partum period to the end of the neonatal period, Broussard reported. This increase was not evident among those who did not attend the sessions, which, she said, suggests that the provision of televised counseling sessions is associated with an increase in the incidence among mothers of a positive perception of their babies in relation to their conception of an average baby.

Among the mothers who saw television there was an association between the degree-of-bother inventory and the depression, psychosomatic anxiety, irritability, fear or concern for the baby, and negative aspects of child-rearing scales of the postnatal research inventory. In the control group only the irritability scale was associated with the bother inventory. The differential correlation revealed between the bother inventory and the attitude scales for mothers who were counseled and those who were not, Broussard stated, tends to indicate an interrelation between counseling and maternal attitudes and the extent to which mothers were bothered by their infant's behavior.

One-fourth of the primiparas rated their infants as less than average at the end of the neonatal period. These mothers tended to be more bothered by their infants' behavior and to have higher scores on the maternal attitude scales. Such findings led Broussard to wonder if it is possible that this group of infants represent a population of "high risk" who will experience developmental and emotional difficulties during childhood. Additional research appears indicated to answer this question.

Within hospital settings, television has mainly been used to provide staff education. The university's project, Broussard said, was an attempt to provide direct service to patients. During this study it was possible for one physician to provide counseling to many more women than would have been possible through a one-to-one approach. The medium of television, Broussard asserted, also makes possible the presentation of content material that cannot easily be demonstrated when the individual physician contacts his patient.

ENVIRONMENTAL HEALTH

Promoting Quality of Life Is New Public Health Goal

The waste products of our burgeoning society have reached such proportions that many large urban areas spend nearly as much on getting rid of trash—largely by the use of 19th and 18th century methods—as they do on educating children, said Dr. Richard A. Prindle, Assistant Surgeon General of the Public Health Service in charge of the Bureau of State Services (now the Bureau of Disease Prevention and Environmental Control).

The Solid Waste Disposal Act of 1965 authorizes the initiation of a national program to develop 20th century methods of solid waste disposal, said Prindle, and its provisions include awards to investigate countrywide or regional approaches to solid waste management and grants to States for surveys of solid waste disposal needs and development of plans to meet those needs. Nineteen demonstration projects are now supported by grants covering up to two-thirds of costs, 21 States have been awarded statewide survey and planning grants, and State and local agencies have been aided in developing techniques for meeting present and future solid waste disposal requirements, Prindle reported.

Under these provisions a full-scale study of composting as a means of disposing of municipal refuse and raw sewage sludge has been undertaken in Johnson City, Tenn., and a plant to process about 60 tons of refuse and sludge is being built, said Prindle. A research grant project at Northwestern University aimed at developing mathematical models for estimating air pollution emissions and operating costs of proposed municipal waste disposal systems is now underway. Still another grant has been awarded to an investigator who has been working on incinerator-powered water desalination on Long Island, N.Y., to investigate the

effectiveness of continuous incineration in producing safe and usable ash, develop design data for equipment for smokeless incineration of bulky wastes, and study the feasibility of producing gas for boiler fuel by heating municipal refuse, Prindle reported.

The goal of public health planners should now be the planning of a positive, pleasant, healthful environment that will not just be free of obvious insults to health, but will promote the quality of the lives led by all people, said Prindle. The new Bureau of Disease Prevention and Environmental Control represents the primary thrust of the reorganized Public Health Service in this direction. It includes the National Center for Urban and Industrial Health, to be located in Cincinnati, which will examine the health aspects of all facets of modern city living and working and plan health protection for the man who is constantly exposed to the fumes of traffic, soot and smell of factories and incinerators, and noise, heat, light, and emotional and physical tensions of the city, Prindle said.

The center will probe into the possibilities of preventing accidents on city streets, homes, and factories. It will attempt to determine the best way to eliminate the slum syndrome that produces not only a high incidence of disease, but also poor physical and mental health. While these are not exclusively health problems, public health workers must be concerned with them, Prindle asserted, and must be willing to coordinate their efforts with workers in other fields to get the job done.

Swimming Pools Present A Public Health Hazard

There are now approximately 400,000 home swimming pools of permanent construction in the country and more than 10 million plastic on-ground pools in the region east of the Mississippi River, according to industry estimates, reported Daniel P. Webster of the Public Health Service's Injury Control Program. The California State Department of Public Health reported 100 home pool drownings in 1963, and figures from Florida and other States indicate that the pool drowning problem was of a far greater magnitude than national figures revealed, he said.

A study of news clippings relating to pool drownings in 1965 from a commercial service revealed that half of the 484 identified victims were children under age 10 and 3 of every 4 was male, Webster said. The peak age was 2 years, followed by ages 1, 3, and 4.

While pool and environment design and construction cannot prevent all instances of trespass and unsafe pool use, it should be the first defense against accidents, Webster asserted. The immediate presence of qualified adult supervision should be the second, and the expansion of instruction in the fundamentals of water survival and swimming the third.

A properly designed and constructed fence can prohibit unauthorized entry of youngsters and make difficult unapproved entry by older children. The fence should be erected at the time that construction equipment is brought to the site, built into the ground as well as above it, constructed of materials that afford no handholds or footholds to use as a ladder, of sufficient height that it cannot be hurdled or easily climbed, and equipped with securely locking gates that are locked whenever capable adult supervision is not present, Webster said.

Municipalities should ban the construction of pools without adequate protective features, dimensions, and depth ranges for use by youngsters and adults, nonswimmers and divers, said Webster. They should also enforce more restrictive standards for lifeguards and insist that the training of youngsters in the elements of floating, swimming, and related skills be included in the school curriculum. Public health groups should support community learn-to-swim programs, Webster recommended.

Steps Set for Compliance With Water Quality Act

The surface waters of the nation will be examined in the context of the Water Quality Act of 1965 from now on, said Richard S. Green, acting chief of the Division of Pollution Surveillance, Water Pollution Control Administration. If the water quality does not meet accepted standards and normal persuasive means are not sufficient to spur pollution control and abatement programs, corrective action as provided in the act will be initiated.

Surveillance is the broader aspect of the effort to obtain compliance with the standards, said Green, and surveillance programs are designed to ascertain improvement, lack of improvement, and degradation of water quality in the river basins. Monitoring programs include localized efforts to determine the efficiency and effectiveness of treatment applied to effluents entering the stream at various points. Successful monitoring substantially reduces the level of more costly surveillance necessary to ascertain stream quality, Green said.

States must submit their water quality standards as well as their plans for implementing these standards and assuring that such plans are met in interstate waters. These proposed standards and implementation procedures will be reviewed under the guidelines that have been issued, said Green, and it is not now possible to determine what the State programs will cover in the surveillance and monitoring mission.

In establishing the surveillance and monitoring program the frequency of sampling cannot be irrevocably fixed and, despite the availability of high-frequency sampling, analytical instrumentation, and modern data processing equipment, the lowest sampling frequency capable of providing the desired information is the best frequency, said Green.

The technical and professional teams at all surveillance stations must be able to provide analyses for plankton, periphyton, benthos, gross radioactivity, specific radionuclides, gross organic content, specific organic content, specific organic contaminants, bacteria and viruses, and an array of the classic sanitary chemical and trace metal parameters, said Green, but all such measurements need not be made at any one station, nor do those made at one station need to be exactly the

same frequency. Only those measurements needed for monitoring a particular pollution situation in a specific segment of a stream need be provided by a station, he said.

Although stream standards using such parameters as DO, pH, and temperature may provide an index of pollution, the assignment of responsibility for a particular pollution program will often depend on the identification and measurement of specific substances and their sources. It is unthinkable, Green said, to expect that pollution arising from untreated waste of a chemical industry can be identified and measured solely by the use of nonspecific determinations of dissolved oxygen, temperature, pH, and conductivity in an elementary surveillance program. Thus, he concluded, the usefulness of the surveillance program will depend largely on the capacity of the technical backup to meet a variety of challenging analytical problems.

Training Program Aids Career Development

It is essential that an orderly introduction and orientation to the field of public health be provided for each new staff member in a public health agency, said B. Russell Franklin and Harvey F. Davis, Jr., of the Division of Environmental Health, Philadelphia Department of Public Health. Sanitarians, engineers, and chemists in Philadelphia's division of environmental health are given an initial orientation to public health and to the department of public health and its interrelationships with other agencies; continued development in the field including topical in-service training, on-the-job training, rotation of staff, staff meetings, supervisory evaluation, and other evaluative tools; and the use of external training for environmental health personnel, they said.

A written training time schedule beginning with the pre-employment interview and proceeding through the orientation program is used by the division.

This training experience is augmented by specialized topical courses developed and presented as program emphasis changes and new programs are undertaken, said Franklin and Davis. The courses usually last from 2 to 5 days and can cover such nontechnical matters as public relations and supervisory development. A course evaluation covering content, time sequence, and effectiveness is filled out by all trainees, and final exams are generally given as a measure of the effectiveness of instruction.

Trainees are rotated from district to district since field problems vary throughout the city, and are rotated from district office assignments to specialized central office programs in accident control, occupational and radiological health, and air pollution control. It is expected that trainees will develop a minimum working effectiveness in each program area this way, the authors asserted.

Opportunities are provided for external training, and environmental health personnel taking short-term technical courses receive full salary plus a daily stipend during the period of instruction. Financial support for full-time graduate academic work is based on educational leave at a three-fourths of pay stipend and agreement to return to the department for 2 continuous years after termination of leave. Since 1954, 24 sanitarians and engineers with the division have earned graduate degrees in public health this way.

Additional opportunities are available through a program for the master's in governmental administration offered at the University of Pennsylvania. Five staff members have received degrees through this program and four are presently enrolled in it. Since the career development program was initiated in 1954, 46 staff members have been promoted, said Franklin and Davis.

Marina, Watercraft Problems Of Sanitation Studied

Owners of more than 130,000 registered watercraft use Lake St. Clair, Mich., and the two connecting rivers for their recreational pursuits, reported Merlin E. Damon, sanitary engineer with the Macomb County (Michigan) Health Department. In an effort to determine the extent of the resulting sanitation problems, the county health department, with aid from the Michigan Department of Public Health and the Public Health Service, developed a three-phase study project to analyze questionnaires answered by marina operators and watercraft owners, observe the habits of watercraft operators, and determine water quality in and around several marina areas, he said.

About 5,000 questionnaires were distributed, of which 1,200 were returned, said Damon. Watercraft owners listed 908 inboard, 111 outboard, 68 inboard or outboard, and 81 sail boats. Of these, 892 had galleys, 1,021 had some type of marine toilet, and 67 had showers. Owners of 137 craft did not provide an answer. Damon reported that 770 owners replied that they stay on their craft while it is at a boatwell, 379 said they do not, and 21 did not answer. A majority of 1,089 owners who felt marinas should supply toilet facilities at the dock said they would walk more than 200 feet to get to such facilities.

Damon said that 1,082 owners reported having a special container on the boat to store garbage and trash while 74 did not have such a container; 995 people said they empty their trash containers into other containers (probably at the marina), 361 said they took the trash back home, and 78 said they dumped it offshore in deep water. When asked how they rate collection and storage of trash and garbage at the marinas or harbors they use, 670 owners said satisfactory, 367 said fair, and 98 said poor. A third of the people said they would prefer a holding tank for liquid waste from the head, while two-thirds preferred a treatment device that would deposit effluent overboard. Damon said.

The observation crews worked on weekends and holidays during July and August and noted that for short trips small craft were out of port an average of 3.47 hours and carried 3.1 people, medium craft were out 3.60 hours with 3.56 people, and large craft were out 3.67 hours with 4.1 people, said Damon. During longer trips, small craft were away an average of 6.66 hours with 3.18 persons aboard, and medium and large craft were away more than than 7.20 hours

with 3.4 persons aboard the medium craft and 4 aboard the large craft.

Samples for bacteriological analysis were collected from sampling stations every other day for 2 months including weekend sampling, said Damon. The water quality at 6 of the 14 stations was extremely variable with high coliform concentrations a significant percentage of the time. The other eight stations showed variable water quality but with coliform concentrations under 2,500 for 95 percent of the time and no significant difference among these stations. The quality was so variable at all stations that there was no statistically significant difference between any two stations and it was not possible to measure the effect of pollution that might be contributed by a marina area into adjacent waters, said Damon.

Environmental Pollutants Continuously Monitored

A multipurpose statewide surveillance system to integrate monitoring of air, water, radiation, and any other critical factors encountered in the environment is being established in New York, reported P. H. Berry and Dr. M. H. Thompson, both of the New York State Department of Health. The system, thought to be the first attempt at integrating continuous measurements of more than a single element of the environment, will ultimately be comprised of 50 continuous air monitors, 60 continuous water monitors, and 300–400 manual stations; 5 continuous air and 5 continuous water monitors will be installed this year. It has not been decided if continuous radiation monitoring will be done separately or within the air and water monitors.

Continuous monitors will be placed in the more populous areas and at sources of major pollution, forming a framework of the comprehensive surveillance system that will be closed in by manually operated intermittent sampling stations arranged in satellite fashion to the continuous monitoring stations. Samples will be taken at the manual stations at correlated intervals varying from 6 to 30 days. It is probable that monitoring of noise, soil pollution, and odor will be undertaken by health agencies in a similar manner in a decade or so, the authors postulated.

The comprehensive surveillance system is expected to establish background data concerning environmental elements which will then serve as a reliable index by which public health personnel can judge the effectiveness of control activities. Continuous monitoring is expected to aid in developing the ability among public health workers to forecast situations which will constitute a threat to the people. This should make it possible to either prevent the occurrence of a hazardous situation or to take protective action against its consequences, Berry and Thompson said. Such a forecasting system for watching the level of certain air contaminants and relating their behavior to changing weather conditions is already in operation on a semimanual basis in New York City.

Collection of comprehensive data on the surroundings of man for the use of researchers is another purpose for the system, and every effort was made to structure the data acquisition system to anticipate the specific needs of research, particularly concerning the precision of measurement and form of recording.

The overall system will consist of remote monitors, the central data reception center, and the telephone facilities which tie the system into an integrated one. Each remote monitor will be comprised of a battery of mechanized samplers housed in a trailer. The eight primary parameters of air quality to be measured on a continuous basis are sulfur dioxide, nitrogen oxide, nitrogen dioxide, aldehydes, total oxidants, carbon monoxide, total hydrocarbons, and soiling. In addition, wind speed and direction, temperature, relative humidity, and precipitation will be measured on a continuous basis in the first five installations for proper interpretation of gaseous measurements.

The water monitors will make continuous measurements for pH, conductivity, chlorides, dissolved oxygen, temperature, turbidity, and oxidation-reduction potential. Solar radiation intensity and streamflow will be measured in parallel in some locations. When suitable analytical equipment is developed it will probably be feasible to make radiation measures in either type of monitor, so purchase of separate radiation monitors is not planned at this time, said Berry and Thompson.

Each trailer will contain electronic equipment to link the analytical instruments to commercial telephone lines connected to a central data reception center, which will be located in the central office of the State department of health. Each remote station will be dialed automatically in sequence on a preprogramed schedule and interrogated for accumulated data. Air stations will be polled every 15 minutes and water stations once an hour, and the data gathered will be stored directly in a machine-processable form. In the process, data will be scanned for abnormal values which can be brought to the attention of operating staff. A special purpose computer will be used to accomplish these centralized control functions as conventional equipment does not offer the flexibility and expandability needed for the system, the authors said. A program for gradually compacting data as it ages will also be provided.

Water Supplies Provided In Alaskan Communities

The Public Health Service has completed 26 projects in its construction program to improve environmental sanitation facilities in Alaska; 13 projects are now under construction, and 3 will be initiated this spring, said K. C. Lauster, chief of the Office of Environmental Health of the Service's Alaska Native Health Area Office.

In the tundra areas where the site is underlain by permafrost and the living conditions are primitive, a central watering point is a practical solution and potable water is usually found by drilling wells through permafrost. In the Bethel area this is usually at a depth of 100 to 400 feet. The water drawn is a fraction above 32° F., iron may run as high as 150 ppm, and volatile solids are from

25 to 50 percent of total solids, Lauster reported. Batch treatment in wood stave tanks for removal of iron is provided in heated buildings, and provision is made for thawing the wells if they freeze. Treatment of water is accomplished either by the use of soda ash to raise pH and chlorine to oxidize the iron, followed by agitation and settling for 10 hours or more, or the use of lime, followed by agitation, settling, and chlorination to remove iron and hardness.

After settling, the supernatant is decanted into a separate tank from which water is drawn into sanitary containers and carried to homes. The Public Health Service provides covered containers for carrying water, tanks for home water storage, a sink, lumber for a sink stand, a sanitary privy, and a "honey bucket" for toilet use during inclement weather and for the aged, infants, or the infirm.

The Service is attempting to put running water in homes wherever possible, said Lauster, and this has been accomplished at Unalakleet, a village of about 650 population on Norton Sound. The site is technically permafrost, but it is on a gravel spit surrounded by water on three sides and water drains through the coarse gravel. The system installed uses pit orifices for circulating water through service connections into the house and back to the mains. Provision is made for heating the water, circulating it, and draining of the facilities if required. All mains and service connections are insulated and laid at an average depth of 5 feet to permit operation without heating from the middle of June through October and without circulation from July 15 through September.

Operational costs run about $15 a month per customer, considerably less than the previous cost for water, Lauster pointed out.

Lead Levels of Blood, Urine Unchanged in Three Decades

A 16-country study of normal values of lead in human blood and urine showed no significant changes over the past three decades, reported Dr. Leonard J. Goldwater and Dr. A. Walter Hoover, both of the School of Public Health and Administrative Medicine, Columbia University.

The data, which do not support the contention that increased burning of gasoline and use of lead in industry are causing additional exposures to lead in the environment, show that mean lead levels in New Guinea aborigines are higher than those in people from California and Ohio and the same as those from New York City.

Goldwater and Hoover reported that among the total population, 95 percent had less than 65 micrograms of lead per liter of urine and more than 98 percent had less than 50 micrograms per 100 milliliters of blood. The data suggested that the normal levels for lead in urine range from 20 to 65 micrograms per liter, and in blood from 15 to 40 micrograms per 100 milliliters.

Occurrence of Nematodes In Benthos Studied

The effluent from a waste treatment plant is the principal source of nematodes in the stream benthos investigated, reported K. Y. Baliga and associates from the University of Illinois. Concentrations of nematodes were significantly higher below the outfall of the plant than above, but concentration in the benthos was not in direct proportion to that in the water of the stream.

Concentration of nematodes in the water and benthos generally decreased with distance downstream from the outfall, said Baliga and associates. Concentration also decreased considerably following a high discharge into the stream, indicating the scouring of nematodes by high floods, and increased in the benthos during prolonged periods of low flows. The concentration of nematodes was generally highest near the banks of a stream and lowest in the region of the main flow, they said.

Baliga and associates reported that the top 2 centimeters of benthic samples were generally found to be aerobic, and 70 percent of the nematodes in a 4-centimeter depth sample were found in the top 2 centimeters.

Although no correlation between the concentration of nematodes and the physical and chemical properties of the bottom material and the environment were evident, said Baliga and associates, nematode concentrations in the benthos were higher during the cooler months than during the warmer ones.

NUTRITION

Nutritional Management May Control Diseases

Recent studies have shown that fluoride may be beneficial in treating and preventing osteoporosis and hardening of the arteries, reported Dr. Mary B. McCann and Dr. Fredrick J. Stare of the Department of Nutrition, Harvard University School of Public Health. Investigators have treated patients with osteoporosis with doses of sodium fluoride varying from 60 mg. to 150 mg. per day in adults for up to 4½ years, they said. Radiological demonstrations and balance studies and bone biopsies have shown that the fluoride favored retention of calcium and lessened its loss by excretion in the urine. In addition, incidental findings in another study showed significantly less calcification of the aorta in high fluoride areas than in low fluoride areas, said McCann and Stare.

Data from a study of Irish-born Bostonians and their brothers in Ireland revealed that the men in Ireland eat almost 800 calories more each day than the Bostonians but are leaner by 8 percent. The men in Ireland also consume more eggs and butter, obtain a higher percentage of their fat from animal sources, and obtain more cholesterol in their diet. Yet the serum cholesterol level of the men in Ireland is slightly lower than that of the Bostonians, and autopsy specimens in Ireland show less extensive vascular disease, the authors reported.

McCann and Stare also reported that current studies indicate that the

biological value and usual amino acid scoring systems now used for assessing nutritive values of proteins may not be appropriate for growing animals. Direct studies are urgently needed, they concluded, to determine the significance of these observations upon estimates of protein requirements at these ages. These studies, in addition to the current interest in alleviating protein malnutrition in wheat-eating countries, such as India, Pakistan, and Algeria, by enriching wheat with lysine, are just a part of current research on ways to meet present and future food needs.

Body Composition Research Used in Studying Diseases

Numerous technical advances in the study of body composition and findings in the study of diseases point to the need for sound body compositional and nutritional research by an interdisciplinary approach, reported Dr. Ruth C. Steinkamp, medical consultant with the Bureau of Public Health Nutrition, California State Department of Public Health. Particularly important among such advances are techniques in underwater weighing to measure body density, opening the way for in vivo research, and the measuring of body density by air displacement combined with total body water measured by isotope dilution for the study of patients unable or too young to cooperate for underwater weighing. Various other techniques to ascertain anthropometric measurements have been developed which, correlated with laboratory measurements of body fat and lean body mass, have led to the development of simple methods for use in epidemiologic studies, Steinkamp said.

As a result, it has been possible to determine some basic changes in body composition accompanying various diseases, Steinkamp reported. For example, researchers have determined that while two children of the same age, one well nourished and one with edematous kwashiorkor, may weigh the same, the well child maintains normal proportions of various gross body compartment measures and the child with kwashiorkor may have an increase of total body water to 125 percent of expected and a decrease of solids to 40 to 46 percent of expected. Similarly, as the tumor of a cancer patient develops, body weight is increased, fat decreased, and total body water increased.

Steinkamp said that techniques for more easily quantitating energy intake and output in a free-living population group are being developed. Documentation of gross body composition in population groups and correlation with the incidence of chronic disease will help define measures for control and prevention, she said.

New Sources of Proteins Sought by Food Planners

Protein malnutrition is probably the world's foremost public health problem, said Dr. W. R. Pritchard of the School of Veterinary Medicine, University of California at Davis. He reported that Agency for International Development health personnel have indicated that correcting serious protein deficiencies of preschool children would make a greater contribution to development than any other health measures. Food technologists must concentrate first on the most realizable possibilities for increasing protein and then on some potential sources of protein, he said.

Realizable Means

Pritchard said that one of the most realistic possibilities for increasing world protein supplies is in the development of marine and fresh water fisheries. In many parts of the world, however, fishing efficiency is extremely low; while each crew member on an arctic trawler may average a ton of fish every other day, each fisherman in many areas averages only 1 ton per year. But conversion to modern techniques by primitive fisheries can strikingly increase the quantity of fish caught as was shown in Puerto Rico, he said, where fishermen have increased catches by 50 percent merely by using gasoline motors.

One of the greatest needs, Pritchard said, is for the development and use of better methods of preserving and distributing fish in underdeveloped countries so that fish consumption is not limited to people living near the coast and wastage due to spoiling is reduced. Pritchard also said that large quantities of fish are made into animal feed for export rather than being consumed by people in underdeveloped countries. Food technologists must change this pattern, he said.

Production could be increased by better management of inland waters and fish farming, Pritchard reported. More than 80 million acres of land suitable for fish culture are available in the Indo-Pacific area alone, and in tropical areas more protein can be produced per acre by fish than with animals.

Efficient use of animal products is similarly hampered by the use of primitive techniques. Although there are some religious and cultural limitations to animal production in the underdeveloped areas, low productivity is largely due to failure to use scientific principles of disease control and animal hubandry. When modern techniques were used in the highlands of Kenya, production was comparable to that of developed countries. Yet livestock diseases still account for losses of 6.71 million metric tons of animal protein each year in underdeveloped countries.

If modern principles of animal genetics, nutrition, environmental physiology, range and forage crop management, and disease control are applied, continued Pritchard, a 50-percent increase in animal production in 15 to 20 years and a 100-percent increase in 50 years can be expected. Countries with shortages of quality protein should, accordingly, give high priority to control of epizootic animal diseases and long-range programs of livestock improvement.

Great opportunity exists to improve the protein quality of the diet of people in underdeveloped countries by fuller use of pulses and oilseeds, such as cottonseed, soybeans, and peanut flour, and the potential for increasing world production of oilseeds is great. Still another realizable means of increasing protein supplies, said Pritchard, is the genetic improvement of cereal proteins.

Potential Sources

Microbial food might be used for human and animal consumption, said Pritchard, resulting in the use of common nonagricultural resources, such as petroleum, and waste products, such as sewage, for food production. The possibility that significant quantities of microbial proteins will be available soon is, however, remote.

The use of algae, which are approximately 50 percent protein and contain all amino acids, is also a possibility. While data on the value of algae in human nutrition is not available, algae soups are said to be palatable, nutritious, and beneficial, Pritchard said.

Protein is now being produced by a French company from petroleum to which ammonia, phosphorous and potassium, trace elements, and growth vitamins have been added. A pound of bacteria containing 50 percent protein, as well as carbohydrates and fats, is said to be produced from each pound of petroleum, Pritchard reported. The protein is said to be 85 to 90 percent digestible in rats, similar to other plant and animal proteins, rich in vitamin C, and to contain a balanced spectrum of amino acids with a high lysine content.

Other sources that might be used as food are bacteria and fungi, synthetics, leaf protein, cell cultures, and insects, Pritchard said.

SMOKING AND HEALTH

Where Will Smoking Control Programs Lead Us?

During the past 3 years since the issuance of the smoking and health report, we have seen many conscientious and worthwhile programs evolve on the national, State, and local levels which deal with the smoking and health problem. Millions of pieces of educational materials have been distributed and much knowledge has been gained about the psychosocial nature of the habit. The fact remains, said Dr. Luther L. Terry, vice president for Medical Affairs, University of Pennsylvania, Philadelphia, that we have made no perceptible inroads on reducing the numbers of premature deaths or reducing the incidence of chronic diseases which are due to cigarette smoking.

Americans today are smoking less per capita. The percentage of male smokers in our population decreased from 59 percent in 1963 to 53 percent in 1964. During the last few years there has been a dramatic decline in smoking among physicians, 60 percent to less than 30 percent. This spells progress, said Terry, yet 51,000 Americans will die of lung cancer this year, and the chance of escaping from other diseases associated with smoking is narrowing.

A report, soon to be issued by the Public Health Service's National Center for Health Statistics, shows a significantly higher incidence of disabling diseases and more work-loss days among cigarette smokers than among nonsmokers. It estimates that there are 12 million more cases of chronic diseases among Americans aged 17 and over than would exist if the people in this age group did not smoke. Emphysema, Terry pointed out, is 13 times more prevalent among cigarette smokers than among nonsmokers.

Terry asked, "What can we do?" The National Congress of Parents and Teachers has begun a smoking prevention program aimed at seventh and eighth graders across the country which, for the first year, will operate in 21 States. At the end of 3 years, it will be operating in all 50 States. Mothers who are PTA representatives in classrooms will help develop home and school activities, involving other parents and teachers, to make children more aware of the danger of smoking.

Another project, the community laboratory program, in San Diego, Calif., and Syracuse, N.Y., tests methods by which organized community action can change cigarette smoking habits through effective use of mass communications and other educational techniques.

Radio and television are giving increasing coverage to smoking and health topics, and more are broadcasting the smoking and health message despite heavy cigarette advertising commitments in these media. In one action, the Public Health Service has awarded a contract to Educational Television Service to provide funds to local educational TV stations for their original program ideas on smoking and health.

The outlook is very encouraging in efforts to eliminate unnecessary premature deaths and diseases caused by smoking, concluded Terry. It is bound to take time, study, knowledge, and hard work to make permanent inroads in a habit so thoroughly learned by the individual person and so deeply rooted in our society.

Smoking Habits Change From 1959 to 1965

How have adult smoking habits changed between 1959 and 1965 and what are some of the reasons? Surveys, taken of more than one-half million Americans in 1959, 1961, 1963, and 1965, have shown that the percentage of male noncigarette smokers in the age group 36–85 years increased from 54.2 percent to 60.3 percent in 1965.

Dr. E. Cuyler Hammond and Lawrence Garfinkel of the American Cancer Society, New York City, stated that the amount of cigarette smoking by adults in certain age groups in any particular year depends on the proportion of people who had taken up smoking during their youth and the proportion who had taken up smoking, given it up, or changed their amount of smoking after the period of youth.

When the subjects of the study were classified into 5-year date-of-birth cohorts, the data showed a proportionate increase in the percentage of cigarette smokers in each group, starting with the earliest one, those subjects born between 1870 and 1874. This is essentially a cohort phenomenon rather than a reflection of changes in smoking habits as people get older, the authors said. During the lifetime of these subjects, cigarette smoking became very popular among women and replaced pipe and cigar smoking among men. Since smoking habits are largely established in youth, people will retain the

habits they acquired unless strongly motivated to change. Thus, the smoking habits of people in each group reflect the popularity of cigarette smoking when these people were in their youth.

A certain proportion of adult smokers gave up the habit because of ill health. The authors reported that between 1959 and 1965 a larger proportion gave it up or reduced their consumption presumably because of reports linking cigarette smoking to lung cancer, heart disease, emphysema, and other diseases. In total, they added, of men born between 1890 and 1929, who had smoked cigarettes at some time, 28.5 percent were smoking less in 1965 than in 1959; 59.6 percent were smoking the same amount, and 11.9 percent were smoking more. The majority of those who reduced their smoking from 1959 to intermediate years did not later reverse their decision; of those who did not change in intermediate years, more decreased their smoking than increased in later years; and of those few who increased their consumption in intermediate years, more than half decreased it in a later year.

Women showed less change in smoking habits than men, the authors continued. The majority of those who were smoking less in the intermediate years than in 1959 were still smoking less in 1965 than in 1959; of those who showed no change in intermediate years, a large proportion decreased rather than increased their consumption in 1965. Of those who were smoking more in intermediate years than in 1959, more than half were still smoking more in 1965 than in 1959.

Hammond and Garfinkel found that persons in ill health and light smokers are more likely to give up the habit than are heavy smokers. Among men, the later the age at start of cigarette smoking, the greater the tendency to stop.

Smoking Attitudes at 15 Influence Habits at 21

Smoking habits of 21-year-olds can be predicted by their smoking habits at age 15. Eighty-eight percent of those who smoked at 15 were still smoking 6 years later, and of those who did not smoke, but anticipated taking up the habit, more than 67 percent smoked. Less than 30 percent of those who did not anticipate smoking later, did start.

Dr. Eva J. Salber and Dr. Theodor Abelin of the Harvard University School of Public Health reported on findings in the followup of a 1959 study of smoking habits among public high school students in Newton, Mass.

In 1959, 35 percent of the boys and 28 percent of the girls smoked. In 1965, at the average age of 21, the percentages were almost double, 63 percent among boys and 55 percent among girls. The most conspicuous changes, reported Salber and Abelin, occurred among students who were discontinued smokers and nonsmokers in 1959, who had become smokers by 1965. Thirty-six percent of the nonsmokers later became smokers, while twice as many discontinued smokers did.

Parental smoking habits, social class, and attendance at honor classes in school were not found to be predictive of changes in smoking habits among nonsmokers after age 15, but, said the authors, the 15-year-old discontinued smokers who relapsed showed a different profile. Discontinued smokers whose parents smoked and who had not attended honor classes in the 10th grade had a higher risk of becoming smokers than those whose parents did not smoke and who attended honor classes. The authors stated that social class was also predictive, but it was the social class of the student measured by attendance at college or entrance into the working world after high school, rather than the father's occupation as the measure of social class. Among the boys, fewer college students had relapsed than the nonstudents. Among the girls, the relapse rate was at the same high level for students as for nonstudents.

In 1959 nonsmokers were asked why they did not smoke. More than half of the girls and 30 percent of the boys gave esthetic or moral reasons. The authors stated that fewer students who gave these reasons started smoking. They were also asked why they thought other students smoked. Among girls who gave such reasons as enjoyment and tension release, more started smoking than among those who did not mention these reasons. For boys, the trend was in the opposite direction.

The discontinued smokers who did not relapse were those who had not found enjoyment in smoking, rather than those who stopped because they were told to do so.

The authors suggested that these findings are not encouraging for antismoking programs among young people over age 15, because those who did not start smoking had esthetic or moral objections which probably had been acquired before high school. However, early identification of the variables which may predict taking up the smoking habit later on, can lead to directed educational campaigns. Such programs, they said, may be more successful than those offered all students indiscriminantly.

Withdrawal Clinics Aid In Smoking Cessation

Withdrawal clinics are valuable in helping people to stop smoking, stated Dr. Charles A. Ross of the Roswell Park Memorial Institute in Buffalo, N.Y., in his report on the 27 clinics that have been held during the past 3 years at the institute.

The clinics were set up to develop a format that could be presented easily to large groups and to learn if a drug or a combination of drugs would be of any value in withdrawal.

Ross said that the clinics were held once a week for 2 consecutive weeks and consisted of a lecture, a questionnaire on smoking history, distribution of literature and medication, and a questionnaire-discussion session. It soon became apparent that the schedule was not intense enough. Some participants felt they had been abandoned after the second meeting. Others who relapsed after quitting smoking felt it would not have happened if they had a more definite and intense program.

The format changed several times, adding more meetings, including films, and more participation of volunteers during their clinic attendance. Lobeline, amphetamine, nico-

tine, methaphetamine, and pentobarbital were given and information about participants' reactions were collected. While medication was of some value initially in promoting smoking withdrawal, Ross said, it had no long-term effect and was not given on a long-term basis.

Ross concluded that various factors seemed to have a relationship to the ability to stop smoking on a long-term basis. Men were more successful than women. Men over 40 years of age were more successful than those under 40, whereas age made no difference among women. Married men quit more frequently than single men, and again, marital status made no difference among women.

Although the clinics were not as successful as hoped, Ross feels that they are still an important part of the overall educational effort in smoking and health, and that organizations could probably conduct them with professional assistance.

Smoking Education Efforts Face Many Challenges

Community support for education about smoking is generally good and 90 percent of the people favor increased health education along this line, reported Roy L. Davis, chief of the Community Program Development Section of the Public Health Service's National Clearinghouse for Smoking and Health. Furthermore, most teachers know the essential facts about smoking and disease and do their best to teach it where appropriate. But approximately 50 percent of our youth are smokers when they leave high school, he said, and some 4,000 youth begin smoking each day.

We cannot even claim success with the 50 percent of high school graduates who are nonsmokers because we do not know if our planned education efforts had anything to do with their decisions, said Davis. It is time, therefore, for public health workers to focus efforts on developing and experimenting with specific education intervention activities and in evaluating the results of such activities more scientifically, he asserted.

We need more information about the influences on smoking behavior of the complex, interacting forces that come from within an individual person and from the people and other realities or fictions of the environment around him, said Davis. A framework of thinking for eventual development of role models for use in smoking programs is emerging, he said, with its dimensions including factors related to motivation, perceptions about the health threat, psychological mechanisms underlying smoking, and environmental factors that reinforce behavior. These elements are now being used to develop instruments and testing approaches to help people determine which type of smoker they are, identify pertinent elements underlying why they smoke, and institute techniques most likely to help them alter their behavior. We must also use the information that is available to us now, he added, particularly data from research in the behavioral sciences.

We must consider the possible need for using a different approach in working with the teacher who smokes and the teacher who does not smoke, Davis proposed, because a person's smoking habits influence his sensitivity, willingness, and commitment to do something about smoking in his own realm of responsibility.

Finally, we must deal with the fact that health knowledge, beliefs, attitudes, and practices of boys and girls are influenced by many forces from many sources, Davis concluded. We must find ways to reinforce through all other powerful influences the same beliefs and behaviors encouraged in school and to shift general unhealthful atmospheres, such as the aura of social acceptability for smoking, to more healthful ones, such as making smoking socially inacceptable.

Smokers Interviewed To Find Dosage Scores

The dosage patterns found in cigarette smoking behavior may be significantly related to the development of effective methods to help people stop smoking.

Selwyn Waingrow, Dr. Daniel Horn, and Fred Ikard from the National Clearinghouse for Smoking and Health, Public Health Service, presented data drawn from a national survey conducted by the Service in 1964. A total of 2,337 smokers were interviewed and their dosage scores were developed as a function of three factors: (*a*) the self-reported number of cigarettes smoked per day, (*b*) the strength of the cigarette smoked in terms of its tar content, and (*c*) the self-reported portion of the cigarette actually smoked.

Dosage scores, the authors reported, were found to be positively related to sex, not related to age, and inversely related to education.

They found that men were heavier smokers in terms of cigarettes smoked per day, portion of cigarette claimed actually smoked, tar rating by brand, and therefore, total dosage score.

Thirty-two percent of the men smoked 25 or more cigarettes a day, while only 18.1 percent of the women smoked this amount. Only 24.3 percent of the men, in contrast to 38.5 percent of the women, smoked fewer than 15 cigarettes a day. The data, they further reported, showed that men who smoked less than 35 cigarettes a day were still more likely to consume a greater portion per cigarette than women who smoked less than that number, but there appears to be no difference by sex between those smoking 35 or more a day. Among women, the greater the number of cigarettes smoked per day, the greater the portion of the cigarette was consumed. Among men, 58.2 percent smoked a cigarette with a tar-rating score above 3, while this was the case for only 41.2 percent of the women. Conversely, 21.5 percent of the women smoked a cigarette that had a tar-rating score below 3, but only 10.2 percent of the men did so.

The major distinction for men for the variable of education seemed to be between high school graduates or less and those having some college or more, with the former having higher dosage scores than the latter. For women the relationship to education appeared to be more consistent—the higher the education, the lower the dosage score.

The authors concluded that there

are several implications of dosage scores. Although the prospect of a less hazardous cigarette that would solve the problem does not appear imminent, the possibility remains that changes in the cigarette combined with changes in the ways people smoke, might produce a level of exposure that is tolerable to many people. The concept can be useful in investigations of smoking cessation, types of gratifications involved in smoking, models of behavior change, frequency rates and length of hospitalization, work days lost through illness, overall death rates, and specified disease mortality and morbidity rates.

Tobacco Use Implicated In Cancer of Genitalia

In a study to determine the history of tobacco use in relation to cancer of the genitalia among women who had ever been married, the records of 283 women who have died of cancer since 1950 (17 of cancer of the vulva or vagina and 266 of cervical cancer) were compared with those of 1,463 women used as controls who have died since 1950 (542 of breast cancer, 349 of heart diseases, and 572 of other noncancerous diseases), reported Dr. George K. Tokuhata, chief of epidemiology at St. Jude Children's Research Hospital and associate professor of preventive medicine at the University of Tennessee College of Medicine.

While 49 percent of the women with cancer of the vulva, vagina, or cervix had been tobacco users, only 37 percent of the control group had been, said Tokuhata. The proportion of cigarette smokers was about the same for cancer patients (0.26) and control patients (0.25), but the proportion of those who used snuff or chewing tobacco, or both, was much greater for the women who had had cancer (0.24) than for the control group (0.13). The ratio of observed number of tobacco users to the expected number based on the experiences of control women was 1.19 for cigarette smokers and 1.48 for snuff and chewing tobacco users. These results indicate that cigarette smoking was not related to cancer of the female genitalia, but that there was a significant association (at the 2 percent level) between the use of snuff and chewing tobacco and these diseases, said Tokuhata.

Researchers took into account each woman's religion, education, occupation, marital status at death, frequency of marriage, number of pregnancies and miscarriages, number of children, and breast-feeding history, as well as each husband's education, occupation, and tobacco habits. After adjustment for race and each of these variables, excess risks to cancer patients who used snuff or chewing tobacco varied from 39 to 54 percent, reported Tokuhata. The use of tobacco in any form by the husbands was not related to the association between the use of snuff or chewing tobacco by the women and cancer of the genitalia.

The association between snuff and chewing tobacco and cancer of the genitalia was stronger for women in the lower socioeconomic class than for those in higher classes. It is not clear, said Tokuhata, whether the tobacco factor is directly responsible or is important in conjunction with the influences of other factors that have not been identified. The association between the use of these forms of tobacco and cancer was clearly demonstrated for women older than 40 years, but not for younger women, he said, perhaps because many women, particularly in earlier years, did not start tobacco habits until late adulthood.

A higher proportion of Negro women than white women used snuff and chewing tobacco. This finding is consistent with the fact that the incidence of cervical cancer is higher among Negroes than among whites. That the proportion of Jewish women who used snuff and chewing tobacco was much smaller than that for Catholic or Protestant women is also consistent with the fact that Jewish women are less liable to cervical cancer, Tokuhata stated.

Smoking Attitudes, Anxiety Measured During Study

Although the percentage of people who have permanently given up cigarettes as a result of smoking control programs is low, there has been considerable short-term change in smoking behavior among study subjects, according to Dr. Jerome L. Schwartz, director, and Dr. Mildred Dubitzky, research psychologist, of the Smoking Control Research Project sponsored by the Institute of Social and Personal Relations and the Permanente Medical Group-Kaiser Foundation Health Plan.

The project researchers evaluated a number of methods designed to help people give up smoking in an effort to investigate the psychosocial aspects of smoking behavior and change effects. The subjects were 324 men between 25 and 44 years of age who smoked at least 10 cigarettes daily and who voluntarily entered the study. They were randomly assigned to seven different treatment combinations and two control groups. The paper presented dealt with 158 subjects who were assigned to the individual counseling or group methods.

Smoking changes were based on results obtained at the end of 8 weeks of treatment, said Schwartz and Dubitzky, and the criterion for success was a reduction in smoking of at least 85 percent from the pretreatment level. One-third of the subjects successfully stopped smoking, one-sixth reduced their smoking 50–84 percent, one-fourth reduced smoking 16–49 percent, and one-fourth did not show even a moderate reduction in smoking. More lower-class and fewer middle-class subjects gave up smoking, but the differences were not significant. Light smokers were significantly more successful.

According to the authors, all subjects in the study started out with unfavorable attitudes toward smoking. On a scale where 8 represented complete lack of belief in the smoking-disease causation hypothesis, the mean score most favorable to smoking was 4.86. It was reported that those subjects who were successful had slightly lower mean scores before treatment, and this success group, as well as the moderate-reduction group, developed significantly stronger beliefs in the disease-causation hypothesis during treatment. On the whole, experience with the smoking control pro-

gram seemed to strengthen negative attitudes toward cigarette smoking.

Anxiety increased for both successful and unsuccessful subjects during the smoking control effort, the authors stated, but successful subjects scored significantly lower on the anxiety scale both before and during treatment than did persons who did not change their smoking habits. It was suggested that this difference might emerge as a predictive index of ability to stop smoking.

Successful subjects showed a slight increase on the self-esteem scale between the beginning and the end of treatment, while subjects who did not change showed a slight decrease in self-confidence. According to the authors, however, evaluative reactions to the concept of "my self" and "my ideal self," compared at the beginning and end of the program, did not change in any of the groups. There were no significant differences between mean scores for successful and unsuccessful subjects either at the beginning or at the end of treatment. Furthermore, stated Schwartz and Dubitzky, self and ideal self were related throughout, but not in the expected direction: that is, subjects who did not considerably reduce smoking were the ones who developed greater self-esteem.

Where Do We Go From Here in Research?

Few causes of disease have been studied as thoroughly as the one between lung cancer and cigarette smoking, according to two research scientists at Roswell Park Memorial Institute in Buffalo, N.Y. Dr. George E. Moore and Dr. Ronald G. Vincent point to the fact that lung cancer which was rare 40 years ago has now become the leading cause of cancer fatalities in men. This has occurred in spite of the fact that lung cancer is preventable. The role of prolonged cigarette smoking as a cause of heart disease and emphysema is also becoming more clearly defined.

Chemicals that cause cancer, particularly those identified in tobacco tar, have been under intensive study by researchers at Roswell Park. Some have been well identified and assayed, but many more remain unknown. As an example, Moore and Vincent emphasized the ability of tobacco tar to cause cancer in experimental animals to a far greater extent than a mixture of all of the known carcinogens isolated from tobacco tar. They pointed out that until the time comes when all noxious compounds are identified and removed from cigarette smoke, it is important to keep exposure of the lungs to this carcinogen at a minimum. They added that the most practical way would be for the smoker to quit inhaling, to smoke fewer cigarettes, to use cigarettes with really effective filters, and to change from cigarettes to pipes or cigars. Cigarettes could also be manufactured by altering the tobacco blend to discourage deep inhalation of the smoke.

In an effort to learn how less dangerous cigarettes might be produced, Roswell Park scientists are evaluating methods of growing tobacco and producing cigarettes. They are also manufacturing smoking products from cabbage, lettuce, maple, and other leaves in order to analyze their carcinogenic potentials. They have found that the smoke causes tumors in animals but those tumors appears at different rates as compared with each other and with tobacco cigarettes.

Moore and Vincent emphasized that safe cigarettes are not likely in the immediate future. However, much more effort should be spent on research in this field. Hopefully people who cannot stop smoking may benefit through those who have invested the time and resources to determine what the best means of protection might be.

CANCER

Cervical Cancer Rates Of Incidence Projected

In 1960 in the United States 8,487 women, 5,776 of them under 65 years of age, died from carcinoma of the uterine cervix, reported Dr. Jeremiah Stamler and associates of the Cancer Control Section, Chicago Board of Health and the Chicago Health Research Foundation. The mortality rate in white women of ages 20 to 64 years was 10.5 per 100,000 women, and the rates for nonwhite women in this age group was 24.9 per 100,000. The difference was similar in rates for women 65 years and older. For the period 1950–60 the mortality rate for carcinoma of the cervix in women aged 20–64 years was reduced 16.7 percent for white women and 8.5 percent for nonwhite women. The reduction in mortality rate for women 65 years and older was even less than the small reduction of rate for younger women.

Cervical cancer, the single most important neoplastic cause of mortality in white women in the United States in 1930, now ranks third in importance. For nonwhite women, however, carcinoma of the cervix remains the chief neoplastic cause of death, the authors said.

The age-adjusted incidence rates for clinically diagnosed invasive carcinoma of the cervix for New York State were 25.28, 25.20, and 25.85 per 100,000 women per year for the periods 1941–43, 1949–51, and 1958–60. Based on this data, the average woman under 40 years has about a 2.1 percent risk of eventually developing cervical cancer, the authors postulated. This risk declines to 1 percent from age 55 on. Data from a 3-year morbidity study in Kentucky, age-adjusted to the 1950 U.S. population, revealed an incidence rate of 30.7 per 100,000 women a year for whites, 54.3 per 100,000 for nonwhites, and 33.8 per 100,000 for all women. The difference between whites and nonwhites was shown to be a correlate of the association between poverty and risk of invasive cervical carcinoma.

From several sets of data from regional studies, an overall age-adjusted incidence rate of about 20 per 100,000 women per year emerges as a conservative current projection for all women in the United States. If this estimate is reasonably correct, it can be calculated from current population statistics that 20,000 women or more are diagnosed per year as having invasive carcinoma of the cervix.

From limited available data, the prevalence rate among white women age 20 and older is at least 200 per 100,000, and therefore 100,000 white women have invasive cancer of the cervix, Stamler and associates estimated. The rate for Negro women is at least 300 per 100,000, so there are about 20,000 Negroes with this disease. For a significant percentage of these women, initial diagnosis still comes too late to save their lives, despite significant advances in recent years in long-term cure rates, they said.

Data on the prevalence of preclinical cervical carcinoma are available from several studies done since the introduction of the Papanicolaou smear. The prevalence rates for carcinoma in situ show no consistent trend with age and a general rate for preclinical carcinoma, predominantly carcinoma in situ, is about 400 per 100,000 in adult white women. Based on this rate, the authors pointed out that about 250,000 women in the United States have carcinoma in situ. Rates for carcinoma in situ for Negro women have been reported higher at younger ages than for white women.

Role of Thyroid Disease In Breast Cancer Studied

A field investigation has found no evidence of an association in cancer patients of a history of thyroid disease and hypofunction with breast cancer, reported Dr. David Schottenfeld of the Memorial Hospital for Cancer and Allied Diseases. However, the presence of a goiter was noted with greatest frequency in the groups with primary operable breast cancer and benign breast disease and least frequency in the group with recurrent or metastatic breast cancer. These differences were not statistically significant.

No instance of hyperthyroidism was noted among study or control patients, and the differences in relative frequency of chemical hypothyroidism were not statistically significant, he said. The proportion of patients with one or more characteristics of thyroid dysfunction were greatest in the primary operable breast cancer group (17 percent) and least in the group with recurrent or metastatic breast cancer (7 percent). Furthermore, the primary operable breast cancer group exhibited antecedent signs of more severe thyroid functional disturbances and compensatory hypertrophy and hyperplasia than did the other groups.

The implications of disturbed thyroid function in relationship to the biologic behavior of breast cancer will have to be further explored prospectively in the cohort of patients with primary operable breast cancer, Schottenfeld said.

Trend of Incidence Rates Of Certain Cancers

In contrast to the reported upward trend in mortality rates in the United States over the past 30 years, the incidence of leukemia has not changed significantly during this period in Olmsted County, Minn., reported Dr. Robert Kyle, Dr. Fred Nobrega, and Dr. Leonard T. Kurland, of the Mayo Clinic. Between 1935 and 1964, 120 cases of leukemia were identified in 61 male and 59 female white persons in this community. The average annual incidence rates per 100,000 population for all types of leukemia combined for the three decades were 7.5, 6.6, and 8.5. The ratio of rates for males to females for each decade was 1.2 : 1, 1 : 1, and 1.2 : 1.

Sixty-eight of the patients (57 percent) had acute leukemia and 52 (43 percent) had the chronic form, said the authors. Of the 120 cases of illness, 33 percent were identified as acute myelocytic, 23 percent as acute lymphocytic, 33 percent as chronic lymphocytic, and 11 percent as chronic myelocytic. One patient had erythroleukemia.

No significant differences have been found in the age-specific rates from decade to decade. The incidence rate among urban residents in Olmsted County was slightly greater than the rural rate. No significant evidence of a close temporal-spatial relationship was found, although the clinical onset of 21 of the 68 cases (30 percent) of acute leukemia occurred in 9 percent of the total time. This temporal concentration requires further study, the authors proposed.

In the United States, mortality rates from carcinoma of the lung have increased dramatically since 1930, and the male to female ratios from bronchogenic carcinoma have risen from 1.5 : 1 to the current value of more than 6 : 1. Based on a preliminary report by Dr. Richard Byrd and Dr. David Carr and their associates, 147 cases of lung cancer were diagnosed in Olmsted County residents for the period 1935–64. The incidence rate increased from 3 per 100,000 population in the first decade to 13.4 per 100,000 in the third, better than a fourfold rise. The rate for males has increased sixfold, but there has been no significnat change in the rate for females.

Incidence rates have increased over ninefold in urban males from the first to the third decade, but only threefold in rural males. No temporal change was found in females in urban or rural areas, the authors said.

Epidemiologic Studies Of Human Leukemia

More conservative use of medical X-rays, following widely publicized 1956 reports on the dangers of ionizing radiation, is one of several possible factors which may account for the present downturn in leukemia mortality rates, according to Dr. Joseph F. Fraumeni, Jr., and Dr. Robert W. Miller, National Cancer Institute, Public Health Service.

Leukemia death rates declined in the period 1961–65 for all age groups under 75 years in the United States, particularly among children 1–4 years of age, the authors said. They theorized that if environmental factors caused the increases in such rates that began in 1921, the recent decline would indicate that these factors have become less prevalent or effective in time, especially among young children, who might be expected to be most sensitive to leukemia-causing agents.

An increase of leukemia at the ages of 3 and 4 years was observed after 1920 in England and after 1940 in white children in the United States and has become more evident with time. But no such peak can be

shown among U.S. nonwhites or in Japan until 1960. These observations, said Fraumeni and Miller, possibly suggest that environmental leukemia-causing agents were introduced or became effective as early as 40 years ago and that U.S. nonwhite and Japanese children were either not exposed or not susceptible to these agents until recently.

Although these trends in leukemia mortality may reflect the presence of unknown leukemia-causing agents, they may also, Fraumeni and Miller cautioned, represent a small part of the total picture of changing medical statistics. Such factors as improved diagnosis of leukemia and longer survival of leukemic children treated with drugs must also be considered.

With the exception of Burkitt's lymphoma, a disease of central Africa, no form of leukemia has provided epidemiologic evidence that supports a viral etiology, Fraumeni and Miller reported.

The epidemiologic approach, the authors pointed out, has been particularly successful in identifying groups of people who run a high risk of developing leukemia. These groups include those exposed to ionizing radiation and, possibly, to certain chemicals. Patients with certain genetic disorders are also at high risk.

Studies have shown, the authors explained, that recent survivors within 1,500 meters of the ionizing radiation released by atomic blasts at Nagasaki and Hiroshima had incidence rates of leukemia which significantly exceeded rates of persons exposed at greater distance or those who suffered no exposure.

An awareness of the association between genetic disease and leukemia or lymphoma has increased recently, Fraumeni and Miller noted. Down's syndrome (mongolism) and, more recently, other genetic disorders with chromosomal abnormality, have been associated with an increased risk of leukemia. Consistent with such an association, they said, are the chromosome aberrations observed after exposure to the known and suspected leukemogens, radiation and benzene. There is also strong suggestive evidence that genetic diseases characterized by immunologic deficiency also carry a high risk of lymphoma. Thus, the authors concluded, chromosomal and immunologic aberrations probably have pathogenic significance in leukemia and lymphoma, rather than being concomitants of the neoplasia.

MATERNAL AND CHILD HEALTH

D.C. Program Aids Rape Victims

The incidence of rape and other sexual assault of women and female children in large cities is increasing rapidly, yet no community has a comprehensive health service program to provide the needed services to victims, reported Dr. Charles R. Hayman and co-authors, all of the District of Columbia Department of Public Health. The D.C. Department of Public Health now provides public health nursing followup to try to insure that patients obtain needed medical and psychiatric assistance from public and private sources.

In a 9-month period, 322 women and female children were seen by the Metropolitan Police Department following alleged rape or sexual assault, received an initial medical examination, and were referred to the bureau of nursing of the department of public health. About 24 percent of the victims were under 13 years old and 53 percent were under 17 years, Hayman and colleagues reported. Only 13 percent of the victims were white and the majority were medically indigent, they said.

Fourteen patients suffered severe trauma requiring emergency care and four of them were hospitalized. A 13-year-old became pregnant, a 4-year-old contracted syphilis, 12 patients contracted gonorrhea, and 13 developed emotional disturbances, reported Hayman and associates. Seventy-three percent of the referrals for 290 patients for medical evaluation and treatment to public facilities and private physicians were completed.

Hayman and colleagues said that emotional support during the first 3 months after the incident was particularly needed and helpful. Epidemiologic analysis of the incidents, aggressors, and victims is necessary to develop measures to reduce and prevent sexual assault.

Asks Sociomedical Grounds For Therapeutic Abortion

A public health lawyer stated the case for consideration of sociomedical grounds as well as purely medical grounds for permitting therapeutic abortions. In countries which make it a crime to perform an abortion except to save a woman's life, abortion is the largest single cause of maternal death, Ruth Roemer, University of California School of Public Health at Los Angeles, pointed out.

Abortion accounts for one-fifth of all maternal deaths in the United States and nearly one-third in California, Roemer reported. And, she added, the toll of criminal abortion must be counted also in terms of complications, morbidity, and disability. In reviewing abortion laws and experiences in several countries, she noted that wherever liberalized abortion laws have been enacted, a reduction has occurred in maternal mortality rates.

Most U.S. liberalization proposals are based on the Model Penal Code of the American Law Institute, which permits abortion where a woman's mental or physical health would be periled by giving birth, where the child is likely to be grossly malformed, or in cases of rape or incest. Roemer, who is also vice president of the California Committee on Therapeutic Abortion, believes that the following proviso should be added to the code: In evaluating the danger to the health of the woman, living conditions and other circumstances that may affect her health should be considered.

If the American statutes take only the limited step of the Model Penal Code, Roemer cautioned, they will be faced with the same problem that Sweden or Denmark had after enacting their statutes in 1938 and 1939—a persistently high criminal abortion rate which necessitated further

amendments. Unless "medical" comes to be interpreted to include sociomedical indications for therapeutic abortions, as the Scandinavians have done and as England is proposing to do, she said, the toll in maternal deaths and disability from criminal abortion will not be halted.

A British bill includes a provision permitting abortion where the ability of the woman to function as a mother may be "overstrained" by the birth of another child. This has been interpreted to include such conditions as an overcrowded housing situation, economic duress, and other socioeconomic considerations.

Roemer noted that the broadest abortion laws exist in the Eastern European countries and in Japan. However, she pointed out that although these countries are commonly considered as permitting abortion on demand, in each case abortion requests are actually subject to review by medical authorities who may recommend against them when "contraindicated."

For those who fear that sociomedical or extended medical grounds for therapeutic abortion open the door to abortion on demand without adequate justification, Roemer reminded that the question of amended abortion laws arises in the United States at a time when knowledge of and access to contraceptive information is rapidly expanding. The time may soon come, she said, when science will permit virtually complete control over a person's reproductive fate. Hopefully, this achievement will be translated into a reality for all families who want it. But, she concluded, until that time, the scourge of criminal abortion should not be allowed to mar the lives of thousands of families each year.

Changes in Abortion Laws Seen as Necessary in U.S.

The practice of abortion in American hospitals is an example of 20th century medicine governed by 19th century laws, said Dr. Robert E. Hall, associate clinical professor of obstetrics and gynecology, Columbia University College of Physicians and Surgeons. Among conditions usually not recognized as valid reasons for therapeutic abortion by the laws are psychiatric disease and maternal rubella, yet half of the hospital abortions today are performed for these conditions, Hall said.

The ratio of therapeutic abortions to live births in the United States is 1 : 500 and that of illegal abortions to hospital abortions, 100 : 1. In Denmark, where the abortion law is liberal, the ratio of therapeutic abortions to live births is 1 : 20, and illegal abortions to hospital abortions, 4 : 1.

These estimates illustrate that hospital abortions are exceptionally rare here and that the demand for abortions is met illegally where it cannot be satisfied legally, said Hall. The 1 million criminal abortions thought to be performed in this country yearly comprise a public health problem of pandemic proportions.

In New York City between 1960 and 1962 the ratio of therapeutic abortions to live births was 1 : 250 in proprietary hospitals, 1 : 400 in private services of voluntary hospitals, 1 :1,400 in ward services of the same voluntary hospitals, and 1 :10,000 in municipal hospitals, Hall reported. The rate of therapeutic abortions per live births was 1 per 380 among whites, 1 per 2,000 among nonwhites, and 1 per 10,000 among Puerto Ricans, he said.

Furthermore, the incidence of criminal abortion is on the upswing and the incidence of hospital abortion is decreasing. In contrast to 1 therapeutic abortion performed per 150 live births 20 years ago, there is now 1 per 500, reported Hall. This situation, he said, is principally the result of the establishment of therapeutic abortion boards, which are likely to be more academic than humane in their judgments. When a board was established at Sloane Hospital, for example, the therapeutic abortion rate declined by a third.

These boards were years in deciding to approve abortions for rubella despite the volume of data on the ravages of rubella in pregnancy, said Hall. The first rubella abortions were done under psychiatric guise on wives of insistent physicians, he said, and while an informed general public has recently forced obstetricians to perform such abortions in open defiance of the law, some hospitals still do not permit these abortions.

The farcical extent of the situation is illustrated by two cases currently being considered, said Hall. Nine San Francisco obstetricians have been ordered before the State medical board on charges of unprofessional conduct for performing therapeutic abortions for rubella; at the same time a New York City hospital is being sued for refusing to perform an abortion on a woman with documented first-trimester rubella which resulted in the birth of a deformed child.

As a result of this confusion and inconsistency, many women must seek a criminal abortion or raise an unwanted child. Therefore, said Hall, a growing number of prestigious individuals and groups have given public support to proposals at least as liberal as those recommended by the American Law Institute in its Model Penal Code, which provides that abortion should be permitted when the mother's mental or physical health is endangered, when there is significant risk of fetal deformity, and in cases of rape and incest. Among the supporting groups are the Association of the Bar of the City of New York, the New York Civil Liberties Union, the New York Academy of Medicine, the California Medical Association, the American Association of Planned Parenthood Physicians, and the Unitarian Universalist Church.

In conclusion Hall asserted that while 1 million cases of cholera or rickets each year would cause a public health scandal, 1 million criminal abortions are embarrassingly ignored. He suggested that the American Public Health Association consider promoting sex education in the schools, pursuing an active contraception program, and sponsoring abortion law reform.

Abortion in Europe

The southern and western countries of Europe, with about 300 million inhabitants, have abortion laws similar to those in the United States and abortion is permitted on medical indication only, reported Dr. Christo-

pher Tietze of the National Committee on Maternal Health, Inc., New York City. Illegal abortions are thought to be quite common in many of these countries, he said.

In northern Europe the laws are much more liberal, Tietze said, and the law recognizes medical, eugenic, and humanitarian indications for abortion. However, abortion has not been "legalized" in these countries in the sense in which this term is often used.

It is the socialist countries in eastern Europe that have adopted the most radical abortion policies, said Tietze. Within the pattern of legal abortion in this region, considerable variation exists between individual countries. Abortion at the request of the pregnant woman is currently permitted in Bulgaria, Hungary, and the U.S.S.R., he reported. Tietze suggested that whatever our way of regulating abortion takes, we can draw on the experience of Europe and learn from it.

Unwed Negro Mothers Lack Medical and Social Care

That unwed mothers, especially Negro ones, are not receiving the medical and social care services they need was clearly brought out by a 1962 study in Boston. Based on the findings, Dr. James E. Teele, Department of Maternal and Child Health, Harvard University School of Public Health, and co-authors concluded that among unwed mothers two factors are strongly related to contact with specialized social agencies: race and residence.

Although there is no reason to believe that deliberate exclusion was in practice in Boston area maternity homes or child care agencies in 1962, the authors said, substantially fewer Negro women had contact with them. Further, they reported, the data indicate that unwed women from the suburbs and other non-Boston areas are far more likely to be served by maternity homes and child care agencies than their counterparts, both white and Negro, residing in Boston.

Based on the findings of the study, the authors recommended that health and social agencies not only review their policies and practices but view these women generally as a high-priority group. Unwed mothers, they said, particularly Negro ones, obviously need financial assistance because they usually have to keep their babies, and they need child care assistance as well as counseling and education in the techniques of birth control.

The authors pointed out that a sufficient number of researchers have shown how likely these women, especially the primiparous young ones, are to repeat out-of-wedlock pregnancies. In the authors' view, social work staffs in hospitals should develop more effective means of identifying unwed women who give birth in their hospitals. When identification is confirmed, the staffs should attempt to give service and counsel to such women. Part of this service, they said, should consist of referral to the specialized agencies. Such referral is especially appropriate, because these women require more specialized service than can usually be given by typically understaffed social work departments in hospitals.

Perhaps the most efficient way to achieve these aims, the authors suggested, is through a State-coordinated program of medical and social care for unwed pregnant women. Indeed, they went on, it may be time to require that hospitals have effective social work departments before they are licensed. And, likewise, it now seems desirable for State agencies to supervise more closely the activities of maternity homes.

The authors proposed that perhaps the maternal and child health section of a State's department of health could lead the way to coordination and improvement of social as well as medical services for unwed pregnant women.

Opinions on Justification Of Abortion Sought

Reported cases of nontherapeutic induced abortions provide only the minimum basis for the estimation of abortion incidence rates, reported Dr. Carl L. Harter and Dr. Joseph D. Beasley, both of Tulane University. Incidence data is particularly difficult to obtain in New Orleans, they said, because it is illegal to have or attempt such an abortion and respondents fear placing themselves in jeopardy of legal action, and because the region has a long and well-established Catholic tradition and most women who defy the church's ban on abortion are not willing to have it known.

Information on people's opinions about abortion is as scarce as data on incidence, said Harter and Beasley. In an attempt to gather information of this type, they conducted a survey in New Orleans to find out from a representative sample of reproductive-age women and a sample of women who were likely to have had or attempted an abortion their opinion on the right of a woman to have an abortion under specified conditions. The researchers reported that a few months after their New Orleans study, the National Opinion Research Center asked similar questions of a representative sample of 1,482 adult Americans and obtained responses which compared favorably with the New Orleans results.

The New Orleans data were gathered from 491 of 540 women ever married, pregnant, or both, who had been previously interviewed and who served as the representative sample, and from 65 women admitted to the gynecological service of Charity Hospital and discharged with a diagnosis of abortion, reported Harter and Beasley.

Analysis of the responses of the representative sample revealed that for four of the seven conditions Catholics were significantly more inclined than Protestants to state that the condition did not warrant an abortion. However, among nonwhites there was no significant difference between Catholics and Protestants in the responses. Among whites, the difference in responses between the religious groups reached the 0.05 or lower level of significance on all items but one, revealing that with the exception of only one situation, it was only among whites that Catholic opposition to abortion was signficantly greater than Protestant, they said. And there was no significant difference in the responses to

any item between Catholics and Protestants in the lower and middle classes (which included whites and nonwhites); the difference between the responses of the two groups in the upper class (all white) reached the 0.05 or lower level of significance on all items but one, reported Harter and Beasley.

The data from the survey of the high risk group of women revealed that women who have attempted abortion are likely to believe the decision to have an abortion should be the right of every woman, Harter and Beasley said. In addition, women who have attempted abortion are likely to believe a woman should be allowed to have an abortion for the specific condition which prompted each of them to seek an abortion.

Nurse-Midwives Alleviate Maternity Care Problems

Community and agency goals in the United States are established with relation to the particular needs of the disadvantaged to whom the risks of childbearing and the threat to the infant are higher than for other groups, said Ruth B. Freeman, professor of public health administration, Johns Hopkins University School of Hygiene and Public Health. The agencies should now begin adapting to the needs of the blue- and white-collar classes as well, she asserted.

The difficulties of a program directed toward the improvement of maternal competence, assurance of a climate of warmth and acceptance for the infant, achievement of personal fulfillment and satisfaction through pregnancy and child care, and adoption of childrearing practices conducive to child growth and development and compatible with the cultural environment stem from the lack of hard data to support a given course of action and the subjectiveness of each decision, Freeman said.

Planners would do well to study current efforts to reach the blue- and white-collar workers and to find out about their problems, she stated, and this should be done without slackening the pace or decreasing energy now being applied to the maternal and child care problems of the poor.

Planners should also consider that in working with the poor they are dealing with the same problems that have been substantially resolved in other groups, and are using the same methods and measures of outcome that have been used in the past, Freeman said. Multiple project support, where each project seems to have its own fiscal pattern, set of influences, and specifications, complicates planning and administration and makes selection among alternative actions a puzzling act. Yet for this group, said Freeman, the approach and methods used appear highly relevant to the success of the program.

Services designed to assess and deal with the complex and interrelated family problems of maternity in all groups of the population should focus on the family rather than on the individual patient and on a warm, sustained relationship between the care staff and the family, Freeman said. Some British communities are handling this need by the use of health visitors who work out of a physician's office and take responsibility for nursing care of his entire patient load. These health visitors, who have had some midwifery training, plan with the physician about the general patterns of care needed and then shoulder much of the responsibility for patient education, emotional support, and mobilization and coordination of supportive services available in the community.

Freeman said that there is ample evidence that under appropriate controls, the nurse-midwife is a safe principal maternity attendant, acceptable to patients and their families. But the number of nurse-midwives is less than 1,000 in the United States and their use as the principal attendant for selected maternity cases has been limited to a few centers. Yet it appears that the needs and problems of today's maternity patient and the skills of the nurse-midwife are extraordinarily well matched, said Freeman. Furthermore, the nurse-midwife is needed not only to alleviate the shortage of physicians and obstetricians, but more importantly because she facilitates continuity of care and can do things for many patients that a physician cannot do as well.

Finally, midwifery opens an attractive field for nurses who want to advance professionally yet remain in direct contact with patients and, said Freeman, such an opportunity might even hold some nurses who would otherwise leave the profession.

Study Hemolytic Disease Of Newborn in California

Proper prenatal prediction of and preparation for the management of hemolytic disease of the newborn (HDN) calls for earlier and wider use of available warning signals. This was especially indicated by the results of a 1961–63 study in California of HDN as a cause of neonatal death, reported Dr. Earl Siegel of the Department of Maternal and Child Health, University of North Carolina School of Public Health, and co-authors. Constant reappraisal of methods currently used will be required, they added.

The study, funded and staffed by the California Department of Public Health and the California Medical Association, was undertaken because (*a*) HDN as a cause of death is a discrete clinical entity, and deaths in which HDN were involved could be readily identified from death certificates, (*b*) approximately 200 such deaths occurred annually in California, making a detailed study of each case practical, and (*c*) it seemed likely that the medical management of this condition could be improved through application of existing knowledge and technology.

HDN was determined to be the correct diagnosis for 328 of 399 cases initially identified from death certificates. Of the 328 cases evaluated, 40 percent were considered not preventable, regardless of presence of contributing factors during the prenatal, labor and delivery, or postnatal periods. The reviewing committees agreed that had ideal standards been met, 23 percent of the deaths were possibly preventable. In another 37 percent of the cases, possible preventability was questioned or disputed by the reviewing committees, and the cases were assigned to an "indeterminate" classification.

Pointing out specific factors related to proper prenatal prediction of and preparation for an affected infant, the authors reported that the following contributing factors were noted in at least 20 percent of the cases: (*a*) no paternal blood studies, (*b*) no paternal genotype where pertinent, (*c*) maternal antibody titers not determined or insufficient number of titers, (*d*) donor blood not crossmatched before delivery, (*e*) no standards in hospital for management of HDN, (*f*) no facilities for exchange transfusion prepared before delivery, and (*g*) no qualified pediatrician notified in time. The latter five factors (*c–g*) were statistically related ($P<0.05$), to preventable deaths when compared with their occurrence among nonpreventable deaths. Only two factors associated with the exchange transfusion were significantly related to possibly preventable deaths: delay in initiation of exchange transfusion, and inadequate monitoring of the infant during the exchange.

Application of several currently useful practices was just beginning in California during the study period. Therefore, these practices were excluded in the committee reviews. Routine antibody screening is receiving increasing attention, they noted. And amniotic fluid examination is considered extremely important in predicting affected infants and the severity of their disease. Newer techniques to be considered and evaluated, they added, are repeated intrauterine transfusions, intrauterine exchange transfusion, and protection from maternal sensitization through the use of hyperimmune gamma globulin (high titer anti-D) at delivery.

Premature Births Studied For Epidemiologic Data

A recent study of the epidemiology of prematurity at the Jewish Hospital of Brooklyn included 197 infants weighing 2,500 grams or less born to Negro ward patients and having no known cause of prematurity, reported Dr. Milton Terris and Dr. Edwin M. Gold, both professors at the New York Medical College. For each premature infant the control was the next mature birth to a Negro ward patient which matched by sex and birth order of the infant as well as age and marital status of the mother. Each mother was interviewed and measured for height and weight on the first or second post partum day and X-rayed for heart volume on the second or third post partum day, they said.

Infants who weighed 2,500 grams or less at birth were considered premature for the purposes of this study, and the study group therefore includes both prematurely born infants and term infants of low birth weight, said Terris and Gold. They found that 10 percent of the mature controls weighing more than 2,500 grams were reported to have a gestation period of less than 37 weeks.

Perhaps the most striking negative finding of the study was the failure to find a relationship between prematurity and prenatal care, said Terris and Gold. For the mothers of premature infants the ratio of observed to expected prenatal visits was 43 percent; for the mothers of mature infants the ratio was 46 percent. The difference in the amount of prenatal care received by the two groups was obviously not significant, they said. Although it has long been accepted that prematurity is associated with lack of prenatal care, this conclusion is open to question, and it has been suggested that this association may just be secondary since the failure to obtain prenatal care may merely reflect other living habits that are responsible for prematurity. Yet while no relation was found between prematurity and prenatal care in the Brooklyn study, this may be because the Jewish Hospital is a voluntary institution with very few walk-in deliveries and the sample therefore excluded mothers with no prenatal care, said Terris and Gold.

The reproductive history of the two groups was quite different, said Terris and Gold, with previous premature births in 54 percent of the multiparous mothers of premature infants and in only 20 percent of the multiparous mothers of mature infants. This tendency to have recurrent premature births may be related to the lifetime nutritional background of the mother, the authors postulated.

Similarly, significant differences were found for maternal weight. Fourteen percent of the mothers of premature infants had post partum weights under 110 pounds compared with only 3 percent of the mothers of mature controls. The ratio of usual weight before pregnancy to height was under 1.7 in 14 percent of the mothers of premature infants and 2 percent of the control mothers. No relationship between maternal height alone and prematurity was found.

Cigarette smoking seemed also to play a significant role, as regular smoking during the current pregnancy was reported by 60 percent of the mothers of premature infants compared with 45 percent of the mothers of mature infants, the researchers reported. No association was found between prematurity and the husband's smoking habits.

Finally, Terris and Gold reported that a significantly lower proportion of the mothers of premature infants had lived in New York City less than 5 years.

Infants and Preschoolers Get Vision Tested

A nystagmus test for screening the vision of infants and older, otherwise untestable, preschool children might prove to be a useful tool for visual acuity testing at home or in the child health clinic, according to two researchers at the Harvard University School of Public Health.

The nystagmus test is based on the opticokinetic nystagmus reflex (a reflex response to a series of moving objects), which is present at birth and is related to visual acuity, explained Dr. Roberta A. Savitz and Dr. Isabelle Valadian.

To elicit this reflex, a device was evolved which was appealing but not distracting, portable, and easy and rapid to use, the authors reported. The device consisted of a roller, 2½ inches in diameter and 10 inches long, wound with alternate black and white insulated wires in helical fashion to appear as vertical stripes. The roller was motor driven, making

the stripes appear to move horizontally. The examiner viewed the subject through a screen placed behind the roller. This permitted maximum visualization and minimum distraction. The visual acuity by this method was defined in terms of the visual angle of the stripes which can elicit nystagmus. For this apparatus, the authors said, the stripes subtend a visual angle at 43 inches that might be expressed as 20/100 in Snellen notation.

Using the device, 104 of 120 infants 9 to 24 months of age showed the nystagmus response, the authors said. The nystagmus test proved to complement rather than supplant the subjective test (in which the person tested reports on the end point) in children 3 to 7 years old. The authors suggested that these two tests might be used together to improve testability, particularly of children aged 3 and 4 years.

A personal history of visual problems also proved an efficient and useful screening tool for both infants and older preschool children, the authors noted. Mothers were questioned about the ophthalmic history of their offspring. In the group of 120 tested with the nystagmus test alone, in a small group given a battery of home tests, and in a group of older children the occurrence of previous history of eye trouble in infants and children who failed the tests was notable, they said.

Vision is a developing function and vision testing procedures must vary with different age groups. Savitz and Valadian suggested that a program started at 1 year of age with a careful history may provide the early detection and care often necessary for optimal vision.

Birth Control Instruction At Post Partum Clinic

The post partum clinic in a large charity hospital is an ideal place for reaching women of proven fertility who wish to plan or limit family size, according to two members of the Emory University Family Planning Program. Describing the program at Atlanta's Grady Memorial Hospital, Dr. Nicholas H. Wright and Dr. Joseph R. Swartwout said that no woman with these goals has been denied contraceptive information and service.

A classroom setting has proved to be an acceptable, efficient, and economic means of conveying information about family planning and guiding in the choice of an effective method. The authors noted that the principal factors in acceptance of contraceptives, in their experience, have been the teacher's confidence in the offered methods and subject matter, the language used, and the reaction of the class. They feel that the background of the nurse instructor is less important than her ability to handle the subject matter clearly and with enthusiasm and professional authority.

Since the patients almost always respond favorably to the idea of family planning or limitation, the group reaction is more important in deciding on a particular method. However, the authors commented, in individual situations the atmosphere of group approval may lead the hesitant mother to a decision for family planning and a particular method. Immediate provision of the chosen method, they said, simplifies the decision by avoiding a return visit for service.

Although many women come to the clinic predisposed to the intrauterine device, the authors said that these women are urged to attend the class in order to learn about all the methods. Knowing the alternatives, they will be less likely to become discouraged if they have to discontinue the chosen method because of side effects.

When the intrauterine device proved acceptable, this contraceptive method seemed to have many advantages over the traditional methods, including the oral method, for the program population, the authors said. Impressions gathered from patients returning to the prenatal clinics tended to confirm the suspicion that traditional methods were discarded or used irregularly soon after instruction.

Wright and Swartwout reported that the program is continuing to offer a nominal "cafeteria choice," but is endeavoring to make the choice of a contraceptive sensible at the outset. They feel that the smaller number of women now selecting methods requiring a repetitive act are more likely to be capable of sustaining their choice to plan or limit pregnancies. They plan to test this hypothesis in a followup study.

COMMUNITY HEALTH SERVICES

The Health Field Needs To Develop Statesmen

The health field is underdeveloped managerially, declared Walter J. McNerney, president of the Blue Cross Association. He called for "a vital new concept of our expectations of leadership in public health" that would lead to the development of statesmen in the health field.

There is widespread agreement, McNerney said, that health services must be developed in a planned manner and not left to the vagaries of noncompetitive or inadequately competitive providers. Both government and the voluntary sector will have bigger challenges to meet in caring for the nation's health in the years ahead, he pointed out.

In trying to meet the total health needs of all citizens, said McNerney, we encounter a critical decision. There comes a point where the cumulative costs of health services are so great that any additional expenditure must be justified in terms of whether some alternative use of the same resources would be more beneficial to the community. It may be inescapable, he commented, that persons in the health field champion their own cause to the exclusion of others. Yet, he emphasized, the great health need of the nation is the management of systems of meeting the great variety of health concerns and of integrating the direction of these systems with all the other broad matters of public policy which concern us as citizens.

The health field needs statesmen, said the author, who can periodically

weigh the justification of alternative measures beyond those which are strictly termed health measures. Such men must have a broad sophisticated understanding of economics, politics, community power structures, and the administrative process, in addition to understanding health problems and processes, said McNerney.

A few such men come along naturally, and they serve as our models, the author stated. We need, he declared, a few highly selected programs on a graduate and postgraduate level to train more. The boundaries of their interests should go beyond and differ from present academic programs of hospital administration, public health administration, or public administration, McNerney emphasized.

We have conquered so many specific health problems, commented the author. Can we now turn, he asked, with some hope of success, to the general ones? The answer lies, he said, with men and women who already are devoting their lives to the public health.

Quality Manpower Needed For Quality Service

It is both philosophically and practically important for public health personnel to remember that health is not the ultimate blessing but is, instead, a means to a higher end, said Dr. William H. Stewart, Surgeon General of the Public Health Service. The health sought today is a condition which not only does not impede individual self-fulfillment, but which actually contributes to it. The American health enterprise must aspire to making the best health services readily accessible to all who need them.

Public health personnel must, therefore, involve themselves in every aspect of the challenge to create a better environment for all the people. They must seek more than mere technical proficiency and must develop the ability to mobilize the work of others around their own perceptions, Stewart said. In some activities public health officials will be in charge, in others they will be members of leadership teams, sometimes in dominant positions, sometimes in subordinate ones. They must be prepared to make contributions in all roles.

Public health has entered the political arena, public health decisions are now made at the highest level of social policy development and decision making, and public health officials must participate as the spokesmen for health in public affairs, Stewart asserted. Public health officials must see their specialty in relation to other specialties and in relation to the generalities by which people live.

Government's Role Essential In Comprehensive Services

To help solve the problems of organization and of manpower for comprehensive personal health services, Dr. L. S. Goerke, dean of the University of California School of Public Health, Los Angeles, suggested four principal approaches.

- Recognize clearly the central, important, and increasing role of Government in the provision of comprehensive health services.
- Legislation and regulation are appropriate and effective means for accomplishing health objectives.
- Look to the universities and professional schools for research and guidance on the problems of organization and manpower.
- Encourage local communities, health institutions, professional groups, governmental agencies, and educational institutions to undertake experiments and demonstrations in new ways of organizing health services and new methods of using, recruiting, and educating health personnel.

Effective organization of health services and sufficient numbers of high-quality health personnel of many kinds will be needed, Goerke stressed, if we are to achieve our national goal of comprehensive personal health services. He reviewed the recommendations of the National Commission on Community Health Services on organization and management of resources (including manpower).

The commission, Goerke said, recognized that no single pattern of organization and management of resources is appropriate to meet all the needs for comprehensive health services today. Planning for use of resources must be on a larger geographic and political basis than community, county, or even State lines provide, but actual delivery of services, he stressed, will be at local and regional community levels. The commission viewed the State health agency as the pivotal source and stressed the need for an integrated, coordinated system of health services. Measures were recommended to increase the total pool of health manpower and make the best possible use of personnel through effective assignment and improved educational preparation. Supervisors need to energetically match qualifications with the job to be done.

Implementation of the commission's recommendations on organization and manpower began even before publication of its report, Goerke said. For example, in a Public Health Service reorganization, one of the bureaus is to be devoted exclusively to the problems of health manpower. Also, he pointed out, a coordinating office for all health programs has been established in the Department of Health, Education, and Welfare.

Other activities at the Federal level, the author reported, concern legislation and its implementation, for example, the recently enacted regional medical program for heart disease, cancer, stroke, and related disease (Public Law 89-239). Its objectives are to encourage and assist in establishing regional cooperative arrangements among groups of public and nonprofit private institutions and agencies so that, for example, training and research in diagnosis and treatment of these diseases will be enhanced. An estimated 40 grant applications for regional medical programs are in various stages of preparation or review. When these are added to the 14 grants already awarded, Goerke pointed out, nearly 95 percent of the U.S. population will be within regional medical program planning.

Title XIX of the Medicare law is also having far-reaching repercussions on the organization of health

services, Goerke commented. The broadened coverage it provides for the medically indigent has impelled legislation in California, he said, which abolishes the distinction between county and voluntary hospitals. Today all kinds of hospitals serve all patients regardless of the source of payment for their care.

Meeting the Health Manpower Shortage

Manpower needs in the field of public health will not be solved if public health officials insist on perpetuating long-established patterns of staffing, said Eli Ginzberg, professor of economics and director of the Conservation of Human Resources Project, Columbia University. In an area like public health, where capital cannot readily be substituted for manpower, the only possible way of making productivity gains is through shifting resources from lower to higher priority gains, he said.

Officials find this shifting of goals and redirection of resources difficult to achieve because of organizational inflexibility and weakness in leadership, Ginzberg said. The fact that the field is so severely fragmented, with semiautonomous units in control of resources focused on specific goals, makes the problem of reform that much more difficult, yet that much more essential, he asserted.

A rethinking of staffing requirements persuant to a rethinking of goals is urgently required, as are corresponding adjustments in the educational structure. Physicians were asked to head up many fields of public health when communicable diseases had priority, but it hardly seems appropriate for physicians to head programs dealing with medical economics, hospital architecture, and water and air pollution, Ginzberg said.

Public health officials might best realize certain high priority goals by developing coordinating devices with others in a position to help. Scientists and engineers are, for example, in a position to help with problems of pollution control and accident control, and groups such as educators, welfare officials, and the clergy can assist in realizing objectives ranging from family planning to the control of diet and smoking, Ginzberg said.

The Role of Voluntarism In Health Programs

Although voluntary associations for health and welfare have a bright and useful future despite the present flurry of governmental activity and financing, there are plenty of dangers and uncertainties in the situation and the future is not necessarily guaranteed, said Lyman S. Ford, executive director of the United Community Funds and Councils of America.

In order to set policies that will insure a useful future for agencies supported by United Funds, a study project has been started to determine if agency services are keeping up with rapidly changing needs and with changes in government programs; to stimulate program review, innovation, and experimentation; to encourage community and agency leaders to think through the relative roles of government and voluntary services; to assess community attitudes and develop a responsive strategy; and to determine precisely who is being served by agency programs and why. At least 50 communities are now actively engaged in such studies, reported Ford, and hundreds more are expected to follow suit. National reports will be made periodically, but the main objective of project leaders is stimulating thought and action locally.

Data already collected indicate rather full agreement that it is important to have a significant voluntary sector in the health and welfare field because the services rendered are valuable and because the citizen interest, influence, participation, training, and education that go along with the operation and support of services is important. Most people feel that a cooperative partnership between government and voluntary agencies is desirable, but duplication of government activities by voluntary agencies is unacceptable. This makes it essential, said Ford, that voluntary programs be flexibile and properly geared to total community program plans. It also necessitates more State and national level coordination and planning of voluntary agencies.

Furthermore, voluntary agencies must maintain their pioneering, innovative, demonstrative role, Ford asserted. They must be efficient, effective, orderly, and highly accountable collectively as well as individually and, in many areas, must develop larger and less-specialized operating units. Voluntary agencies should also be set up to serve all economic groups, for services geared to meet the needs of those who can pay as well as those who cannot are usually of a higher quality than those established just for the poor, said Ford.

Participation in the Poverty Program by voluntary agencies with Federal funds seems to have raised the prestige of those organizations and helped them gain positive visibility. However, it is recognized that a point exists at which the proportion of government versus voluntary funds in a budget gets so high that the agency may cease to be really voluntary, warned Ford.

Federal Aid Threatens Quality of Research

In 1947 the Federal Government paid for about one-third of the nation's medical research, today it pays for a half, and in the future it will pay for two-thirds if current trends continue, said Basil O'Connor, president of the National Foundation—March of Dimes. Although the intentions behind programs providing this support are entirely honorable and worthy, the side effects of the programs could seriously impair the total national effort toward better health, he warned.

An increasing peril exists to the professional health of the scientific community, he said, for in field after field scientists find that as governmental support has increased, support from private foundations has been elbowed out. The diversity essential to free scientific inquiry has been curtailed because there is only one source of support and this support is filtered through a series of professional committees of scientists

with a habit of funding each other's projects and those of their disciples.

There is, in addition, an alarming tendency in Federal programs to emphasize quantity over quality, as demonstrated in the government's tendency to establish vast training programs to produce scientists without sufficient concern for the quality of those trained, O'Connor said. Not only are many Federal science programs given more money than they can fruitfully use, but the preoccupation with quantity results in great numbers of routine grants while truly innovative projects, which always threaten the established experts on the panels, often go unsupported, he charged.

Finally, the major private sources of support, including the Rockefeller Foundation, the Ford Foundation, the Commonwealth Fund, and the Markel Foundation, are withdrawing from the health field in the face of massive government intervention. But men who are trained, gifted, and bold enough to create new concepts and prospects in the biomedical field need the climate of free inquiry in which to work and tax money, no matter how ably administered, has never bought that climate, O'Connor said.

If the Federal Government continues to pay for the education of more and more scientists and underwrite more and more of the research in our universities, it will attain virtual dominance of scientific education and the practice of science in this country during the next 15 years, O'Connor warned.

Try New Patterns of Care To Aid Chicago's Poor

The Office of Economic Opportunity has encouraged communities throughout the country to examine their present patterns of providing health care to their indigent populations and to evaluate these in relationship to the community as a whole. In this context, the office awarded a grant to the Chicago Board of Health to explore the present situation, to evaluate health needs, and to plan a program to meet these needs in the city's poverty communities.

We sought, said Dr. Mark H. Lepper, vice president of Presbyterian St. Luke's Hospital, and associates, to examine the reasons for the markedly lower level of health in the poverty area as compared to the nonpoverty area. Although general living conditions were undoubtedly major factors, another was that health services are not as available to the residents as to residents elsewhere in the city.

Sources of Care

Exploration revealed, the authors reported, that poverty populations have fewer physicians available to give care and that, on the whole, these people make fewer visits for ambulatory care. They spend less money for ambulatory care than the national average. Large segments of Chicago's poverty population are dependent upon Cook County Hospital for inpatient care. In an average 24-hour period, approximately 1,200 people are seen in the admitting and emergency room area of that institution, the authors said. Approximately 800 of these are seen for a specific complaint. The complaint is handled, but no provision is made for continuing care. If the person becomes ill again, his only recourse is to return to Cook County Hospital's admitting and emergency area.

Limited resources, said the authors, pose major problems when one attempts to recommend solutions. To change the total pattern of care, the study group recommended that a long-term medical care system be developed which would make it possible to deliver comprehensive care to a whole community.

We know, the authors said, that the manpower facilities do not exist by which we can guarantee to every resident a personal physician at this time. By the joint effort of the major community hospitals, teaching institutions, and voluntary agencies, however, we can begin to develop a series of comprehensive family care centers and coordinated programs of health care in defined geographic areas. These centers would be planned and administered by existing voluntary hospitals and medical schools and would extend the services of these institutions into the community. The board of health, said the authors, would work with hospitals and medical schools "in defining areas, coordinating the programs, and interdigitating the services currently available in these communities at the Chicago Board of Health stations" with the new programs.

Experimentation

Implicit in the development of these centers, the authors emphasized, would be experimentation with new methods for the utilization of medical and ancillary personnel, as well as the learning of new ways to deal with the socioeconomic and cultural factors which keep the poor from using medical facilities.

Our plan envisages three echelons of care, explained the authors. The first is represented by the public health nurse and aides trained to assist her, who would serve in the role of a family health advisor to help in the initiation of care and maintenance of continuity. The second echelon, the neighborhood health center, would be operated by a parent institution as an extension of their outpatient services into the community. The parent institution would also serve as the third echelon of care, providing referral outpatient department services and inpatient hospital care when needed.

The study group recommended that some specific goals be set for large-scale, citywide crash programs. In selecting these programs, the authors said, we considered both the areas of greatest need and the feasibility of succesfully carrying out the programs on a broad base. These programs included the preschool examination, prenatal care, immunization, health education, and extension of family planning services—primarily extensions of programs currently in operation. They need to be conducted so that as comprehensive care programs are developed, these fragmented programs can be integrated and coordinated into the whole.

Progress to Date

Since submission of the committee's report, steps have been taken, said the authors, to implement the

program. A director of medical care services for the Chicago Board of Health has been appointed. The board of health has received grants from the Office of Economic Opportunity and the Children's Bureau to develop two neighborhood centers, and contracts have been signed with two hospitals for such programs in defined areas. Additional medical institutions are working with the board in developing proposals. Work has begun developing and extending citywide crash programs.

SALMONELLOSIS

Nonfat Instant Dry Milk Harbored *Salmonella*

A recent epidemic caused by *Salmonella new-brunswick*, a previously rare *Salmonella* serotype in the United States, was traced to instant nonfat dry milk. Dr. Richard N. Collins and associates at the Communicable Disease Center, Public Health Service, reported that 29 cases occurred in 17 States throughout the eastern half of the country and on the Pacific coast over a 10-month period in 1965 and early 1966.

The incidence was unusually high in infants, the authors noted. Eighty percent of the patients had consumed powdered milk before their illness. One adult patient was a strict vegetarian, and diets of several of the infants consisted exclusively of instant nonfat dry milk because of feeding problems.

At first, reported Collins and associates, no specific commercial brand could be implicated with certainty. In April 1966, however, the Food and Drug Administration notified the Communicable Disease Center that an FDA field laboratory had isolated the *Salmonella* organism from shelf samples of one product. The authors found that in the processing plant the drying process was begun by passing the skim milk through a plate heater. The milk was brought to 162° F., and supposedly was held at this temperature for 10 to 15 seconds. There were, however, no thermostatic or time controls in the system. Consequently, there was no assurance of pasteurization, and at no point later in the process did the milk appear to be held at a high enough temperature long enough for it to be pasteurized.

After the milk was passed through the plate heater, it was concentrated, dried, and finally "instantized." The instantized milk, distributed by jobbers and repackagers, eventually entered boxes bearing the labels of several widely distributed brands of instant nonfat dry milk.

The equipment in the plant for handling liquid milk could be easily cleaned, the investigators reported. The internal construction of the instantizing system, however, allowed dried milk to cake and collect in inaccessible areas. Bacteriological analysis revealed, they said, *S. new-brunswick* contamination in instant nonfat dry milk for human consumption and in materials (coarser particles of the same milk) destined for animal feed. The contamination was sporadic, and further bacteriological studies of the environment pointed to the instantizing process as a source of salmonellae within the plant. *S. new-brunswick* was the only serotype found in the products produced at the plant.

The mode of initial contamination of the plant remains obscure, said the investigators. A bacteriological examination of animals, environment, and feed samples from 30 farms having problems raising calves did not reveal the presence of *S. new-brunswick*.

Salmonellae Epidemic From Smoked Whitefish

The tracing of a salmonellae epidemic which occurred in the United States in 1966 was reported by Dr. Eugene J. Gangarosa and associates at the Communicable Disease Center, Public Health Service, Atlanta, Ga. The study was done in cooperation with public health officials in New York, Philadelphia, New Jersey, and Canada.

Between May 25 and June 1, 1966, more than 12 separate outbreaks of febrile gastroenteritis were recognized, affecting more than 300 persons who had eaten smoked whitefish. *Salmonella java* was isolated from stool cultures and from whitefish in the same batches as that eaten.

All contaminated whitefish had been processed at one plant, the authors reported, but the source of contamination was not established within this plant. Two shipments of whitefish from Great Slave Lake, Canada, were found to be contaminated with *S. java*, in addition to the shipment involved in the epidemic.

The most likely cause of contamination, the authors reported, was probably the practice of using raw river water to wash fish after dressing them and also using the water to make ice to pack the fish in. A combination of circumstances that favored the growth and proliferation of salmonellae at the processing plant probably caused the epidemic.

Possibly previous epidemics in the metropolitan areas of New York, New Jersey, and Pennsylvania have arisen from similar sources and circumstances, the authors concluded.

Commonest Infection Of Man and Animals

Salmonellosis is probably the most common infectious disease found in both humans and animals, according to Dr. James H. Steele and Mildred M. Galton, of the Communicable Disease Center, Public Health Service.

Rapid advancements in the processing of food products for human and animal consumption have resulted in large-volume production and distribution. Development of the necessary bacteriological standards, however, has lagged, and widespread epidemics have occurred.

Steele and Galton noted that salmonellae inhabit most species of warm-blooded animals and many cold-blooded vertebrates, but that the major reservoirs of human salmonellosis are in domestic livestock. Poultry, red meat, and egg products are the major sources of *Salmonella*. In addition, the authors said, recent reports have indicated the presence and spread of salmonellae in soya

milk, dried yeast, coconut, cottonseed protein, thyroid extract, cereal powder, smoked whitefish, nonfat dry milk, and carmine dye.

Animal feeds, the authors reported, frequently have been found contaminated—providing an excellent means for the spread of infections in domestic animals and fowls. Whether salmonellae in animal feeds produce acute infection or only a carrier state, their presence establishes a path of transmission from feed to animals to man, they pointed out.

Control procedures, however, can be applied at certain points in the epidemiologic chain of infection. When cases occur, Steele and Galton emphasized, the sources of infection must be found, the chain of infection defined in each instance, and control measures formulated to prevent recurrence.

MENTAL HEALTH

Mental Hazards Increased For Some Family Members

National Institute of Mental Health researchers, headed by Dr. Earl S. Pollack, Office of Biometry, Public Health Service, have found that certain family members are particularly susceptible to mental illness requiring psychiatric treatment. Their findings, gathered in two States, Louisiana and Maryland, with different types of populations were surprisingly uniform. The findings from a survey of first admissions to all the psychiatric facilities in these States over a year's time show that rates of admission for women who head families are higher than for men who head families. A related report by the same office notes that many of the women are divorced and separated and may have severe personal problems that need resolving. Their situation is further complicated by the fact that they are often trying to work and take care of their families as well.

The research group found that women who head families of six or more are more likely to suffer mental illness than women who head smaller families. Also, wives of heads of large families have higher admission rates than wives in smaller families.

The children of women who head families are more likely to enter psychiatric treatment than children with both parents in the home, they said. Several institute studies have emphasized the importance of the father's presence in the family for the mental health of the child.

A three-sided family may have some unique emotional problems, the group reported. For example, the only child in a family of three has higher admission rates than children from larger families, where both parents are present. In addition, the rates are usually high for a relative living with a married couple.

The investigators obtained their results by relating patient data to 1960 U.S. Census reports. Statistical studies such as this will be helpful in planning mental health facilities for high-risk groups in the population, the authors concluded.

Community MH Centers Will Help in Crises

Helping a person promptly at the peak of an emotional crisis will become an important treatment tool in the new community mental health centers, reported Dr. Melvin Singer, National Institute of Mental Health, Public Health Service.

He pointed out that an individual in crisis appears to be more open to change than at any other time. Crises, regardless of their cause, break the balance between the person and his environment. Periods of turmoil last only a short time and may offer therapists an excellent opportunity to help a person grow and mature emotionally.

The technique of crisis intervention is particularly valuable for community mental health centers which will emphasize prompt and short-term treatment, Singer continued. While an estimated 17 million Americans need treatment for emotional disorders, present services reach only 1 to 2 million. The improbability of relieving the shortage of manpower in psychiatry impels a new approach to treatment services. The tools of prompt crisis intervention used by professional workers and nonprofessionals under their supervision will spread the benefits of modern psychiatry to many more people, he stated.

Federal support has been provided for 128 centers as of July 1966, Singer said. Each center will have an average of 27 professionally trained staff members, and an equal number of nonprofessional volunteers. They will serve about one-tenth of the people who need psychiatric care. Ultimately, mental health officials hope to establish a total of 2,000 centers.

Use College Students In Mental Health Work

The manpower shortage has engendered nontraditional selection of personnel for various kinds of programs to aid troubled people, concurred Dr. Gerald Goodman and Earl C. Brennen of the Interpersonal Relations Project in Berkeley, Calif. Their reports described the use of college students in mental health services.

Goodman described an experiment in which college students were paired with troubled boys in a 1-year companionship. The college students, in applying for the positions as counselors of the boys, describe themselves on various questionnaires and forms and take a social insight test. The major source of information, however, on which final selection of the counselors is based, Goodman and Brennen pointed out, is group assessment sessions, in which eight applicants and three staff members participate. At the end, applicants rate each other, and the three staff members rate the applicants, on warmth, self-disclosure, empathy, rigidity, surgency, and so on.

After the students are hired as counselors, half the quiet collegians are paired with boys evidencing quiet problems, and the other half are paired with boys having outgoing problems. The same procedure is used with outgoing counselors.

thereby creating four dyad types. Then boys and counselors are matched according to social class. The counselors' training is conducted in small groups oriented toward self-disclosure and self-exploration, led by professionally trained workers.

Although it is still too early to say which boys gain most from this program, said the authors, it is possible that group-trained college students can help significantly when paired with isolated, depressed, or withdrawn boys.

Observing that recruitment is easy because the campus offers a large pool of potential workers within a small area, Brennen noted that students regard the work as a learning experience and welcome supervision, training, and courses which supplement mental health programs.

An incomplete survey about 5 years ago, he reported, showed 87 colleges in the United States had programs in which students were assigned to work in mental hospitals, and the number of participating schools probably has increased. A followup study revealed that 31 percent of 120 patients were discharged from the hospital while working with students. This proportion was 10 times the expected discharge rate for these patients, and more than half of them were considered greatly improved.

Brennen forecast that new patterns in the development of manpower will be required for the new community health centers. He said that these facilities should offer services to children, primarily because mental health programs tend to neglect them. Individual psychotherapy, the favored method of treatment in current programs, is best suited to adults.

Traditional services for children also might benefit from supplemental programs using nonprofessional helpers, Brennen observed. Child guidance clinics, for example, employ numerous professional personnel and apparently do not always achieve the desired results.

He compared a conventional program for girls with the Interpersonal Relations Project for boys. Until the service was modified along group work-recreation lines, about half the girls dropped out. The attrition rate for boys counseled by college students is about 12 percent for a complete school year.

Children, Brennen said, seem to enjoy the company of an interested and nondemanding adult. Students will do things with children and provide an atmosphere wherein feelings can be shared and new responses can be risked without penalty.

The shortage of professional personnel, it was concluded, has led to novel and effective uses of nonprofessional helpers. College students are an attractive source of such manpower.

Emergency Psychotherapy Is Sound Public Health

If only a small percentage of chronic emotional illness could be prevented by prompt emotional first aid, the saving would be tremendous, declared Dr. Leopold Bellak, visiting professor at Columbia University's Teachers College and at New York University. About half the hospital beds in the nation are taken up by psychiatric patients. Even if chronic emotional illness does not imply hospitalization, it accounts for a staggering amount of decreased social function.

Legislation enforcing mental health care presents difficulties, however, because of the danger of infringing on civil liberties. Nevertheless, the author said, making the prevention and spread of emotional disorders a subject for public health law is part of an inevitable trend. There is a parallel between finding a contagious foodhandler and finding a disturbed and severely disturbing teacher. Without a wildly chauvinistic, probably paranoid history teacher, Adolph Hitler might only have become a small-time misfit.

However, Bellak continued, mental health measures as part of public health will not be effectuated until there is appropriate legislation, including the enforcement of treatment. Young Lee Harvey Oswald was seen at Youth House in New York by a psychiatrist who recognized the potential seriousness of the boy's disorder. Oswald's mother, however, was able to move him away because it was impossible to enforce treatment, Bellak said. The basic legislation will make it possible to protect society, by psychotherapy or by means of primary prevention, from serious harm.

Specifically, to have emergency care, Bellak continued, at least a skeletal staff must be available 24 hours a day, preferably in the emergency unit of every general hospital. It is imperative that complete psychodynamic understanding of the patient be attained promptly. Then the procedures can be instituted to bring about optimum results.

Used nationally, emergency psychotherapy and its adjuncts are valuable, the author concluded, and may help to resolve numerous social problems.

Wisconsin Develops Day Care Programs

More than 1,800 mentally retarded and mentally ill persons are receiving service at Wisconsin's 57 day care centers, according to Dr. Kenneth H. Rusch, community services director, division of mental hygiene, Wisconsin State Department of Public Welfare.

He discussed the 1961 Wisconsin law which provides 40 percent grant-in-aid to assist communities in establishing day care programs for the mentally handicapped. Implementing the law, continued Rusch, revealed several problems. Some of its requirements, adopted wholesale from community clinics legislation enacted 2 years earlier, were not readily applicable to day care. The stipulation that there be a single board governing the day care program created difficulties. Although each county was restricted to one clinic, many Wisconsin communities already were operating a number of small day care programs—each sponsored by its own private nonprofit corporation. Now there are county-wide programs under a single overall day care services board in 26 of Wisconsin's 72 counties.

Day care programs, Rusch said, provide collaborative and cooperative services with public health, educational, vocational, welfare, and other professions for the training,

habilitation, and rehabilitation of mentally ill and retarded individuals. They also offer educational and informational services. It is important, declared the author, that day care programs not subsitute for those possible through the school system, but that they support and complement each other.

Very liberal professional and program standards were adopted, he continued. The alternative would have been to assist a few elaborate programs which could be displayed with pride in metropolitan areas while continuing the majority at the marginal level with little or no possibility of their meeting eligibility requirements. Providing funds, consultation, and training opportunities for marginal programs, it was believed, would benefit the State more.

About 260 persons, including psychologists, physicians, teachers, social workers, activity therapists, and nurses, are employed in the centers, Rusch reported. Volunteers are used extensively, and considerable service has been rendered by college students participating in the work-study projects created by the Economic Opportunity Act. The estimated State cost for 1967–69 is more than $2.5 million, or a combined State-local investment of more than $6 million.

Many communities have developed greater continuum of day care. Some, which formerly had only preschool nursery programs for retarded children, now offer services for older retardates and sheltered workshops for the adult mentally handicapped. Free interchange has developed between day care, school, and community clinic personnel. Day care centers are an adjunct of State and county mental hospitals, and general hospitals have shown an interest in them. These developments, Rusch stated, have resulted in innovative and creative programs ranging from those which are simply designed to the very sophisticated.

Vaccine to Prevent Streptococcus Infections

A vaccine to prevent streptococcus infections, which frequently lead to rheumatic fever in children and glomerulonephritis in adults and children, is being tested by University of Chicago scientists. It was described at the scientific sessions of the American Heart Association meeting in New York City by the developers, Dr. Eugene N. Fox, Dr. Albert Dorfman, and Mrs. M. K. Wittner, of the La Rabida-University Institute.

The vaccine is prepared by purifying a protein, called the "M protein," from the cell wall of the streptococci which cause the infections. The body responds to the vaccine by making antibodies against the M protein. When streptococci invade the body, antibodies which have formed react with the M protein in the cell wall and help the body destroy the invading organisms before an infection begins.

The vaccine has been found safe and effective in extensive tests with mice, rabbits, and guinea pigs. It has led to no serious reactions and has increased levels of antibodies against streptococcus organisms in nearly 50 adults tested. However, only further testing, particularly in infants, will demonstrate its effectiveness in preventing infections under ordinary conditions.

The vaccine is effective against several of the most common types of streptococcus organisms that cause human infections. The La Rabida-University of Chicago group is working toward developing a vaccine which will be effective against five or six types of streptococcus organisms which cause most infections in urban populations. Other attempts to prepare a streptococcus vaccine have failed because the M protein used was not purified sufficiently.