

*The Institute of Agricultural Medicine of the State University of Iowa is unique in that it is devoted exclusively to the public health of rural areas. This interim report gives the first account of its research program.*

# Institute of Agricultural Medicine in Iowa

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**I**N CONTRAST to urban dwellers, rural families have enjoyed relatively little of the protection afforded by public health agencies. For this reason, research at the Institute of Agricultural Medicine at the University of Iowa has undertaken exploratory studies of rural health, with identification of major needs as its first concern. With sympathetic collaboration by investigators in other centers, a general evaluation and demonstration of rural health programs will ensue.

Public health functions, historically, have been designed and organized to serve urban populations. Particularly is this true of the epidemiology of infectious disease, the foundation of public health work. The massing of large populations created an excellent breeding ground for epidemic and endemic infections. The wealth and governmental experience of the cities at the same time provided facilities for public health activity; otherwise, the cities would have perished.

Traditional public health methodology is not always applicable to rural conditions. Techniques of control and investigation, designed for urban settings, frequently are not well suited to the sparsely settled communities. The nature of local government structure in

some rural areas precludes the establishment of typical administrative public health programs. Disease and accident reporting, a prerequisite to efficient public health programing, is inadequate especially in areas that are not organized on a communitywide basis. Considerable study is needed to determine what the real health needs of rural populations are, how health services for rural segments of the population are being met, and wherein they can be improved.

## Rural Health Hazards

The saying, "The farm is the safest and healthiest place in the world to live," is frequently heard in rural areas. Although it may be the "healthiest," available statistics show it to be something other than the "safest" place in which to live. The number of farmers killed on the job in 1955 exceeded that of any other single occupational group. Of a total of 14,200 occupational deaths, 3,700, or 26 percent, occurred among farmers, estimated at only 7 percent of the working population. On the basis of rates of fatal on-the-job accidents, farming is the third most dangerous occupation, only mining and construction outranking it (1a). The total number of farm injuries in 1956 was 1,050,000 (1b). Tractor accidents alone account for approximately 700 deaths among agricultural workers each year.

The variety and amount of chemicals in com-

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mon use on the farm suggest another health hazard. Expanding agricultural application of insecticides, fumigants, herbicides, rodenticides, fungicides, and even fertilizers has resulted in no less than one-quarter million brand-name chemical products now being used. An estimated national total of 3,300 accidental deaths are caused each year by the misuse of chemicals (2). Commercial label warnings, including instructions concerning precautionary measures, are often impractical under field conditions.

By virtue of their occupation, their environment, or both, farmers and other rural dwellers are frequently exposed to animal diseases. Iowa, with a total human population of approximately 2.5 million, has a domestic animal population which includes 6.5 million cattle, 1.3 million sheep, 12 million swine, and 30 million fowl (3). In addition, it is estimated there are more than 1 million dogs and cats.

#### **Establishment of the Institute**

Iowa, with a substantial rural population, has a vital interest in the health of agricultural workers. The opportunity to explore this area on an organized basis was made available by a 3-year grant from the W. K. Kellogg Foundation in September 1955. The Institute of Agricultural Medicine, the first in the United States, was established as a part of the department of hygiene and preventive medicine of the College of Medicine, State University of Iowa. After expiration of the original grant, the institute will continue to function as an integral part of the College of Medicine. Present personnel consist of a medical director, an industrial hygienist, a social anthropologist, a toxicologist, a statistician, and a public health veterinarian. Future plans call for the addition of a health educator and a safety engineer.

As originally conceived, the function of the institute is the demonstration and evaluation of public health problems of a rural nature. Activities of a control or regulatory nature are not considered a part of the institute program. A close working relationship has been established with the following groups and agencies: Iowa State Medical Society; Iowa State Department of Health; the Iowa Farm Bureau Federation; the School of Veterinary Medi-

cine, the School of Agriculture, the School of Engineering, and the Extension Service of Iowa State College.

#### **Survey for Baseline Data**

Our initial problem was lack of basic rural public health data. Limited available information served only to suggest probable or potential rural health problems. Epidemiological information on infectious diseases, accidents, and other suspect problems was non-existent. In an effort to establish baseline information, an extensive rural health survey has been designed. It is expected this study will result in the recognition of specific problem areas. Future activities can then be designed to investigate these areas in detail.

Classical toxicology studies of hazards in the agricultural use of chemical products based on short-term animal experimentation are time consuming and expensive and their results questionable when applied to humans. The institute has established facilities to investigate the possibility of utilizing tissue culture techniques as a method of toxicological evaluation.

Accident prevention studies may be organized on an anthropological basis. Why do different ethnic groups, living in geographic proximity, engaged in the same tasks, and using essentially the same equipment, have significantly different accident rates? Why are certain groups of individuals willing and eager to use safety devices, while other groups refuse to consider the use of such items? To what extent are advances in agricultural mechanization responsible for accidents? These and similar questions may be answered by socioanthropological investigation.

Recent studies in this area indicate certain groups consider safety devices "sissyfied" and therefore unacceptable. In many areas it is considered quite reasonable not only to dispense with personal safety gear but also to remove these safeguards built into farm machinery. This is particularly true for cornpickers and power takeoff systems. The institute in collaboration with a local Iowa company has developed a cornpicker safety tool. A controlled field trial of this new tool, including a group acceptance study, is now in progress.

A study designed to investigate the differences between various groups in accepting routine immunization procedures has been completed. Families in the lower socioeconomic brackets were found to neglect routine immunizations when left to their own devices. Specific suggestions by the family doctor had little or no influence. However, such families were quick to participate in any sort of community-sponsored immunization program.

### Zoonotic Patterns

Animal diseases are of importance to the health of rural people. Of the 115 diseases in this category, approximately 40 are known to occur in Iowa. Although classic epidemic disease patterns are infrequently observed in rural populations, epizootics of animal diseases may be expected to occur in rural areas. Recognition of an epizootic pattern is frequently the most efficient method of identifying a potential or existing human health hazard.

Leptospirosis constitutes a rural health hazard of unknown proportions. Repeated surveys in various parts of the United States have shown that 3 to 12 percent of the cattle population is serologically positive for leptospirosis (4-8). The incidence of leptospirosis in swine is thought to be considerably higher (5, 9). Relatively little investigational work has been done on human leptospirosis in Iowa. Serologic diagnostic facilities are unavailable at either the medical college or the laboratories of the Iowa State Department of Health.

Only recently have such facilities been established at the School of Veterinary Medicine. To gather baseline data on the incidence of human leptospirosis the institute now is testing all serum samples submitted to the laboratories of the State health department. The vast majority of these samples are submitted by practicing physicians for brucellosis testing. On the basis of some 3,000 such tests, approximately 2 percent are *Leptospira* positive. A similar survey of 1,000 premarital blood samples has resulted in the detection of only one positive specimen. Future activity in this area will be the routine investigation of all serums positive to *Leptospira*.

Q fever has been demonstrated as existing

in enzootic form in Iowa dairy cattle (10). Although less than 1 percent of the cattle appear to be infected, it is estimated that 3.5 percent of the dairy herds contain one or more infected animals. *Coxiella burnetii* has been isolated from the milk of serologically positive cattle. Preliminary human serologic studies show 8.5 percent of 200 Iowa veterinary practitioners to be Q-fever positive.

In cooperation with the State and Federal departments of agriculture, and the Iowa State Department of Health, an attempt is being made to investigate the possible relationship between tuberculosis in farmers and the occurrence of tuberculin-positive cattle. Particular attention is given the matter of tuberculin-positive cattle which appear to be free of lesions at slaughter inspection. This project is supported by a grant from the Iowa Tuberculosis and Health Association.

Iowa's poultry industry is rapidly expanding. Several cases of suspect human psittacosis due to domestic fowl contact have been investigated. The possibility that psittacosis is occurring in domestic fowl in Iowa is currently under investigation. This study comprises the routine screening of fowl serums for evidence of infection. A field trial of the antibiotic and millet seed preparation, as perfected by Dr. K. F. Meyer for the control of psittacosis infection in cage birds, has been completed. The product proved completely effective.

Rabies constitutes another serious problem in Iowa. Efforts have been made to isolate rabies virus from both normal and abnormal Iowa bats. All such efforts have proved unsuccessful to date. The fact that most barns house a bat colony serves to stimulate interest in this problem.

A project protocol has been written and an enabling grant received for the epidemiological investigation of toxoplasmosis. The results of preliminary studies indicate a high correlation between human toxoplasmin sensitivity and a history of routine animal contact. Of particular interest is the role of *Toxoplasma* in cases of degenerative retinitis in farmers.

Future research plans of the institute include a study of rural mental health. Iowa's suicide rate is 30 percent above the national average. Consideration is being given the matter of de-

layed or chronic sequelae of infectious diseases such as brucellosis. An attempt will be made to explore the effects and methods of rural health education.

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### Perrott Retires

George St.J. Perrott, chief of the Division of Public Health Methods of the Public Health Service since 1939, retired June 30, 1958.

Director of the National Health Survey during 1935-36, he also directed the development of the National Health Survey established in 1957. Mr. Perrott has been associated with the direction of *Public Health Reports* since 1943 and was a major influence in the decision to convert the weekly edition to an expanded monthly journal in its present form. He has been managing director of *Public Health Reports* since 1952.

Mr. Perrott first joined the Public Health Service in 1933 as principal statistician. Previously, he served with the Bureau of Mines, where, from 1927-31, he directed the activities at the Pittsburgh Experiment Station, a research center for studies on health and safety in industry.

From 1917 to 1927, he was a chemist with the Chemical Warfare Service in Pittsburgh;

during a Washington assignment with the Warfare Service in 1918-19, he carried the rank of first lieutenant.

Recognized as a national authority in health statistics, Mr. Perrott received his education at the University of North Dakota and Princeton University. He is a member of the American Statistical Association.

Dr. William H. Stewart, special assistant to the Surgeon General for program operations since 1957, succeeds Mr. Perrott as chief of the Division of Public Health Methods.

Dr. Stewart was commissioned in the Public Health Service in 1951, serving as chief of the Epidemiological Unit of the Communicable Disease Center at Thomasville, Ga., during 1952 and 1953. After assignments with the Heart Disease Control Program in the National Heart Institute in 1953 and 1954, he was named assistant chief and then chief of that program in the Bureau of State Services. In 1956 Dr. Stewart became assistant director of the National Heart Institute.