

USERS AND USES OF THE UNITED STATES NATIONAL ANIMAL
HEALTH MONITORING SYSTEM DATA: THE MICHIGAN EXAMPLE

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Two constant questions that are often raised are, "who are the users of data from the National Animal Health Monitoring System (NAHMS) and what can they use these data for?" This paper will attempt to answer those questions using data from NAHMS in Michigan.

The NAHMS in Michigan began in 1986 and only collected data from the dairy industry. Sixty of the 6,012 dairy herds were randomly selected (using multi-stage sampling procedures, based upon probability proportioned to animal numbers) for inclusion in the study. Veterinary medical officers (VMOs) from the University, State and Federal Departments of Agriculture visited the herds every month for 12 months. Data relating to disease problems, management, production, preventive practices, drugs used, and costs associated with the aforementioned items were collected. The 60 herds were stratified further according to the six agricultural districts and herd size category (10-49, 50-99, 100-199, and 200 or more adult cows). Using a simple random procedure, 6 herds were selected as subsample herds for more intensive study. Twenty-five percent of the animals from each category (cows, young stock, and calves) were selected by systematic sampling procedure for studying in more detail. Blood and feeds were collected for laboratory testing of evidence of various infections and nutritional deficiencies. Fifty-four herds completed the study.

After a twelve month observational period, the data obtained were analyzed and have been used by eight users - farmers, veterinary practitioners, teachers of epidemiology and animal health economics, college administrators, industries, researchers, extension officials, and state/federal policy makers. Examples of specific data sets that were used by each of the eight users will be presented.

Farmers: The particular farmers on the study were given monthly, semi-annual and annual reports. These reports included comparisons of disease frequencies and associated costs on their farm to stratum average frequencies and costs.

Veterinary practitioners: Several data sets were found to be of interest to practitioners. For instance, of the top 10 disease conditions in cows (mastitis, metritis, repeat breeder cows, lameness, retained placenta, milk fever, dystocia, cystic ovary-follicular cyst, ketosis, and anestrus) 34.2% were treated by a veterinarian, 55.4% by the farmers only, and 10.4% by both the

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veterinarian and the farmer. From Round 2 data it is estimated that only 29% of the drugs used to treat the aforementioned conditions were given under the supervision of a veterinarian compared to 66.8% that were used without the supervision of a veterinarian and 4.2% partly under the supervision of a veterinarian.

Other data sets that were of interest to practitioners were the frequency of use of veterinarians, mean monthly risk of disease, specific services requested by the farmers, and the proportion of herds reporting a herd-health visit on a monthly basis.

Teachers of epidemiology and animal health economics: Data from NAHMS in Michigan have been used at the College of Veterinary Medicine to teach veterinary students the following concepts: sampling methods (simple random, systematic, stratified, and multistage sampling procedures); epidemiological study designs (cross-sectional, case-control, and prospective studies); measures of disease frequency (prevalence and incidence rates); risk analysis (relative risk, odd ratios, and attributable risk); and surveillance. The NAHMS data base has been very useful in providing real examples to illustrate these concepts.

The data are being used to support two PhD and two Master of Science graduate students. The data base is being used in graduate training courses to cover concepts of: study designs; sample size determination; risk assessment; modeling of disease; simple and multivariate analytical techniques; biases in epidemiological studies; and economic analytical tools.

College administrators: Wyman, et al (1987) have pointed out that there is an increasing awareness that societal needs for veterinary services in the 21st century and the veterinary curriculum is becoming increasingly discordant. Administrators in the colleges of veterinary medicine have often wondered about the changing societal needs for veterinary services. Information regarding the current status of veterinary utilization and the health needs of dairy farms should aid administrators in decision making. Data regarding four specific areas have been provided to the College of Veterinary Medicine administrators: 1) frequency of visits by veterinarians on Michigan dairy farms; 2) the types of general services (from the farmers' view point) that are being performed by practitioners; 3) the most common diseases/problems for which veterinarians are actually called upon; and 4) risks of disease.

It is hoped that information from NAHMS data will be of value to the college administrators. In fact, considerations are already underway to utilize information from NAHMS in designing continuing education programs for practitioners and in the discussions regarding changes in the veterinary medical curriculum.

Industries: Several marketing sections of pharmaceutical and/or biologics industries have requested information regarding the frequency of specific disease problems observed, and the type of drugs and vaccines being used. These data are available for such users. Nutritional agri-business companies have been interested in information regarding the frequency of use of feed consultants, type of feed systems used, and which animals get custom rations. It is curious to note that 82.8% of the study herds used nutritional consultants other than a veterinary practitioner.

Researchers: Several researchers are using NAHMS data base to study various biological relationships. To date, these studies have utilized quantitative epidemiological and economic tools to address infectious and non-infectious disease problems. Examples of these include: 1) systems approach for elucidating risk factors associated with respiratory disease and metritis in dairy cattle; 2) epidemiological and economic modeling of lameness and repeat breeder cow syndrome in dairy cattle.

Extension specialists: State and federal cooperative extension specialists working in the state have used information from NAHMS in their programs. Examples of specific information that was found useful are: ranked risk and cost estimates of various disease/problems; proportion of cases treated by veterinarians; and proportions of drugs used with and without the supervision of a veterinarian (see section veterinary practitioners). The breakdown of drugs, for example, used to treat the top 5 diseases in cows was: 49.1% antibiotics, 28.1% combinations (multiple antibiotics, antibiotics and steroids), 12.0% nutritional supplements, and 10.8% sulfa drugs. The above information on drugs was very useful to the extension personnel for planning strategies on drug residues. As Wise (1987) has stressed, there is a need to develop better data reporting methods to accurately estimate producers' use and purchase of animal health drugs and services.

State and federal policy makers: The data have been given to state and federal officials of departments of agriculture. The data provided are being used in the state by the Agricultural Experiment Station together with information from other sources to develop a regional cooperative research efforts focusing on epidemiology and economics. Although not completed yet, data from all NAHMS participating states are being evaluated by the USDA/APHIS. It is anticipated that priorities in research funding and other functions of APHIS may be reevaluated as more information from NAHMS accumulates.

CONCLUSION

1. Substantial amounts of information can be derived from the data as they currently exist.
2. More value can be obtained from the data as each of the individual user groups identifies specific needs.
3. Rigorous quantitative epidemiological and economic analyses will yield more knowledge regarding the causal pathways and economic consequences of disease.

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