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EPIDEMIOLOGY IN ACTION - AN APPLIED TRAINING COURSE

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En 1991, un nouveau cours intitulé "Epidémiologie en action" a été créé par les Centres d'épidémiologie et de Santé animale. Ce cours a été conçu pour promouvoir l'application de l'épidémiologie de terrain, en développant les aptitudes des Officiers Médecins Vétérinaires et des épidémiologistes dans les Services vétérinaires du Département de l'Agriculture des Etats-Unis d'Amérique (USDA). Jusqu'à maintenant, plus de 40 participants ont suivi cet enseignement, au cours des 5 dernières années. Cet enseignement comporte un pré-requis en épidémiologie de base, et s'appuie sur les aptitudes antérieurement acquises.

Dans cette formation à l'épidémiologie en action, chaque participant choisit un projet épidémiologique qui lui est propre, et qui est directement en relation avec son activité professionnelle. Ce cours repose abondamment sur des discussions de groupe et sur la mise en situation à partir des projets épidémiologiques personnels. Par ailleurs, chaque participant fait l'objet d'un suivi particulier par un tuteur. Une caractéristique fondamentale de ce cours est sa plasticité, de façon à permettre son adaptation aux besoins des participants. Pendant cet enseignement, les participants travaillent sur les objectifs d'une étude, l'hypothèse nulle, et la planification de projet. Ils développent leur projet, réalisent l'analyse des données qu'ils ont collectées, rédigent le rapport de leur projet et en font la présentation. Les tuteurs et les conférenciers ont été choisis parmi les membres de l'USDA, qui ont déjà une compétence acquise et une formation avancée dans les différents thèmes du cours. La formation des tuteurs et des conférenciers est diverse, et consiste aussi bien en Master ou en doctorat en épidémiologie, en économie, en entomologie, qu'en une abondante expérience de terrain ou de gestion de données.

La toute première évaluation de cet enseignement repose sur le constat d'une nette augmentation des aptitudes des participants, mesurée de différentes manières, comme l'évaluation de leurs projets, l'évaluation du cours par les participants et les conférenciers, et l'auto-évaluation par les participants de leur niveau d'aptitude avant et après le cours.

In 1991, a new course entitled Epidemiology In Action (Epi in Action) was developed by the Centers for Epidemiology and Animal Health (CEAH). The course was designed to improve field application of epidemiology by increasing applied epidemiology skills of Veterinary Medical Officers (VMOs) and epidemiologists within Veterinary Services (VS), United States Department of Agriculture. To date, over 40 participants have completed the course, in ten sessions which have been given during the last five years.

GOALS OF COURSE

The course was designed to improve field application of epidemiology by increasing applied epidemiology skills of VMOs within VS. It is not meant to be an introduction to epidemiology, but rather, be a course in which participants take the skills learned in previous epidemiology training, refresh them, and apply them to a specific project. In this way, participants practice their epidemiology skills in a field setting on a real-life problem, thus increasing their ability and comfort in performing epidemiologic projects in their daily job activities.

Participation in the Epi In Action course results in the fostering of relationships and interactions between VMOs, epidemiologists, and specialists at the CEAH. Participants are exposed to the epidemiologic expertise and infrastructure which is available within VS at all levels including area offices, regional offices, headquarters staffs, and the CEAH. Previous to participation in the course, many VMOs have been unaware of the extent of the expertise available to them for consultation and assistance on work assignments and projects.

PREREQUISITES

A prerequisite to the course is the completion of previous epidemiologic training. Typically, previous training consists of Basic Veterinary Epidemiology I (Epi I), an epidemiology course offered within VS by the Association of Teachers of Veterinary Public Health and Preventative Medicine. Epi I is a two week classroom based course covering topics such as descriptive statistics, disease frequency, sampling and surveillance, questionnaire design, literature review, properties of screening tests, economics, and decision tree analysis.

INSTRUCTORS/MENTORS

Over 40 instructors and mentors have been involved in courses to date. These instructors and mentors are selected from USDA employees who have expertise and advanced training in the various course topics. Experience of past instructors includes masters and doctorates in epidemiology, public health, economics, and

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entomology as well as extensive field and analytical experience. Instructors with expertise in computer software programs and applications such as Epi Info and GIS have also participated in the course.
The role of the mentor is to guide a participant through his/her project. The mentor provides personal expertise to the participant as well as putting the participant in contact with additional expertise as needed. It is also the role of the mentor to oversee progress of the project in the interim time period between the first and second sessions, ensuring readiness of the participant for the second week of the course. Prior to the beginning of the course, participants indicate topic areas for their projects. Based on this information, an attempt is made to match mentors with participants based on project topics and the mentors' areas of expertise.

PROJECTS

The core of the Epi in Action course is the design, implementation and analysis of an epidemiology project. The topic of each project is selected by the individual participant with guidance from their mentor and encouragement that the topic have relevance to the participant's work setting. Existing data can be utilized in projects or new data can be collected. If new data are generated, it is usually via the development and administration of a questionnaire. Many of the projects have tended to be descriptive in nature, but analytical projects testing a null hypothesis have also been completed.
Examples of projects which have been completed in the past include the following.

- Effectiveness of brucellosis herd testing and surveillance based on herd size in three Louisiana parishes.
- Evaluation of testing results for tuberculosis by private practitioners.
- The risk of introduction of foreign livestock diseases to the United States by pet dogs.
- Ticks on imported reptiles into the Miami International Airport, November 1994 through January 1995.
- Analysis of area spread of pseudorabies in Nebraska.

STRUCTURE OF THE COURSE

The course is divided into two, one week sessions of instruction. By the end of the first week, each participant has developed a study objective, null hypothesis (if applicable), and project plan, all of which are presented to the group. In the interim time between sessions, the participants implement their project plans. At the start of the second week of the course, they should have their data collected, entered into a database in a clean format, and some preliminary analysis completed. During the second week of the course, the focus is on epidemiologic analysis of data and preparation of a project report and presentation. The second week ends with each participant giving a project presentation. A project report or scientific paper from each participant is also a requirement of the course, but is typically completed after the end of the course.
One of the strengths of the Epi In Action course is the flexibility of its agenda based on the needs of the participants. Over the years, the topics taught within the course have varied. The early courses leaned heavily towards analytical epidemiology and data base management including Structured Query Language techniques and usage of Oracle data bases. More resent courses have focused to a greater degree on study design and descriptive analytical techniques. Since this is an applied epidemiology course, basic epidemiology skills are not taught. However, it is recognized that many of the participants may need a refreshing of these skills so the course typically begins with a review of basic epidemiology principles such as measures of disease frequency, analytical tools and techniques, and sensitivity and specificity issues. Recent topics from the first week of the course have also included critical reading of literature, questionnaire design, study design, planning and implementation of a study, Epi Info training, library research and research techniques utilizing the Internet and CD ROM's. Case studies are used as a means for the participants to practice their epidemiology skills through discussion of real-life situations. Practiced skills include problem solving, critical thinking, and descriptive analysis techniques. Built into the agenda are time periods for the participant and their mentor to work one-on-one. It is during these times that the study objective, null hypothesis, and study design are developed, fine tuned, and finalized.
One of the most beneficial and valuable features of the Epi In Action course is the time spent in group discussion. Typically, a full day is spent with the group providing input to each participant's project. Each participant presents his/her project plan including study objective, null hypothesis (if appropriate), and study design. Through discussion, the other participants, mentors, and instructors provide suggestions, potential hazards and pitfalls, and general thoughts. In this way, each participant receives the benefit of many individuals' expertise and experience for the development and improvement of their project. As these discussion sessions work through each project plan, the participants benefit from participating in and listening to the input and discussion on all the projects, not just their own. This format provides real life case studies as a learning tool.
A project plan is developed and completed by each participant by the end of the first week of the course. This plan details the project objective, plan for accomplishment, time line, and required resources. It is signed by the participant, mentor, and participant's supervisor. The signed project plan indicates the commitment by the participant to complete the project, the commitment by the mentor to provide guidance and assistance with the project, and the commitment by the supervisor to allow the participant time within their work schedule to complete the project.
The second week of the course tends to have fewer structured group activities. Most of the time is spent individually working on project analysis and preparation for the project presentation. During this time, there is heavy involvement by the mentors with the participants. Structured topics typically covered during this week include analysis techniques, writing scientific papers, and presentation skills. The week ends with project presentations by the participants. Each presentation is followed by a discussion of what was learned during the project experience. These discussions include what went well with the project, what did not, and what the participant would have done differently in hindsight.

Many principles and theories of adult education which contribute to effective training programs are incorporated into the Epi in Action course. These include training which is learner directed, problem centered, shared experience, mutual planning, and collaboration.

EVALUATIONS

The primary outcome evaluation for the Epi In Action course is an improvement in the participant's epidemiologic abilities as measured via several mechanisms. These mechanisms include participant self evaluation of skill level prior to and upon completion of the course, course evaluations, assessment of projects, and participant participation in projects and symposiums after completion of the course.

The participant self evaluation was used at the courses given in the Southeastern United States. It consisted of a list of epidemiological abilities for which the participant rated their skill level from "1" (very able) to "5" (not at all able). Participants completed the evaluation at the beginning of the course and again upon completion of the course. All participants felt that they have increased their skill levels in at least one area of skill, with most doing so for multiple skills.

Evaluations of the agenda topics and instructors are collected at the end of each day during the course. These evaluations ask the participants to rate each topic on its usefulness and on the effectiveness of the approach to the topic. The scale used is 1(very useful/effective) to 4 (not useful/effective). It is also asked if each topic had too much time, too little time, or the right amount of time allotted. Participants are asked to provide general comments on the pluses and minuses of each day and if they have any remaining unanswered questions. The results of these evaluations are used for the development of agendas and the selection of instructors for future courses. In recent years, rarely has a participant indicated that they thought less time should have been spent on a given topic. Rather, it is frequently indicated that the participant would have preferred more time spent on a given topic. Allotting more time to any topic while not giving less time to other topics or making the course longer is a significant challenge. One way this has been addressed is the addition of an optional day at the beginning or end of the session. This has been done to provide in-depth training on topics such as GIS and Epi Info.

Upon completion of the Epi In Action course, participants are encouraged to present their projects at work conferences or symposia. Tracking of this information is attempted, however, it is typically gained via indirect communications which has resulted in incomplete data. While we do not know the exact number, it is known that many of the projects have been presented at area work conferences. Four Epi In Action projects were presented at the Veterinary Epidemiology and Economics Symposium held in College Station, Texas in 1995. One of these four won the "Best of the Symposium" award. Another subjective indication of the success of the course is the fact that a number of participants have gone on to mentor other participants in future courses.

From personal interviews with past participants, it is clear that the group discussions and one-on-one time with mentors are the most valuable features of the course. The practical application of the course materials and the practical nature of the projects makes it a course from which the participants feel they can take the skills they learned and apply them to their current work situations.

CONCLUSION

The Epidemiology In Action course results in an increased "epidemiologic attitude" towards daily work activities, which in turn results in the increased application of epidemiologic principles to current work issues. It demonstrates the value of data that the VMOs collect on a routine basis. The VMOs better appreciate the importance of collecting high quality data and how that data are used by analysts. The course also increases employee understanding of program strategy and Agency decisions, which are frequently based on epidemiological principles. A course outcome of greater scope is an increased APHIS ability to respond to emerging and emergency situations by having broader epidemiological expertise at employee levels in addition to designated epidemiologists. After completing the course, participants can better apply epidemiologic skills to newly emerging animal health situations as well as increasing the epidemiologic component to foreign animal disease investigations and emergency situations.