Research as a tool for the teaching of epidemiology

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At a medical school in India, undergraduates have been given the opportunity to volunteer to conduct research as a means of improving their knowledge and understanding of epidemiology. First-year clinical students have conducted case-control studies with emphasis on methodological detail. Second-year students have been involved in community-based epidemiological studies. At the intern level, projects related to social factors in health and disease and to health administration have been encouraged. This initiative has been largely welcomed by the students and has yielded highly encouraging results.

Since 1985, efforts have been made at the Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry, India, to restructure the medical curriculum. In the Department of Preventive and Social Medicine, modifications have been introduced in the teaching of community medicine in general and epidemiology in particular. In addition to the theoretical teaching of general epidemiology it was decided that students should be encouraged to volunteer to conduct epidemiological investigations so that they could gain a better understanding of the subject. It was intended that the students should thereby be able to:

- describe the methods of epidemiological investigation;
- appreciate the role of risk factors in the causation of disease;
- appreciate important epidemiological aspects of communicable and noncommunicable diseases;
- identify areas of research based on their importance in public health;
- develop research protocols, including study designs, sampling techniques, and statistical methods;
- locate and review the literature;
- plan for the resources required and conduct the studies;
- analyse and interpret data;
- develop communication skills, including communication with patients and sharing information with peers;
- write a scientific paper.

Some of the more detailed objectives were that the students should learn to decide on eligibility criteria for the selection of cases and controls, to collect data in the field, and to appreciate the importance of cost accounting in health care delivery and of the influence of social factors on health status.

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First clinical year

As in the case of second-year clinical students and interns, participation in research projects was optional during the first year. Each project was a hospital-based case-control study and involved three to seven students working for two to three hours daily over a period of six to eight months. The five projects completed between 1990 and 1992 dealt with risk factor analysis in oral cancers, protein-energy malnutrition, myocardial infarction, birth asphyxia and cervical carcinoma. Stress was laid on methodology, i.e., formulation of objectives, review of literature, defining cases and controls, building up proformas and their modification on the basis of pretesting, statistical methods, and the writing of reports. Progress was monitored on a daily and weekly basis by two or three faculty members, who encouraged the students to reach decisions on their own initiative. With the help of transparencies, each student presented an aspect of the study in which he or she was involved to an assembly of first-year and second-year students and faculty members, and responded to questions.

Second clinical year

Projects in community medicine lasting two months were undertaken during vacation time by second-year students in accordance with the short-term summer research programme of the Indian Council of Medical Research. Each student who volunteered took up a separate project. The topics chosen were such that the findings would be of value in the planning of services in urban and rural field practice areas. Between 1987 and 1992, cross-sectional field studies were conducted on: immunization coverage and mothers’ knowledge about child immunization; the prevalence of dental caries among preschool children; social, cultural and economic factors affecting pregnancy; the epidemiology of cataract; blood pressure and hypertension; the nutritional status of preschool children; the nutritional and educational status of school-age children; and drug compliance by leprosy patients. During the same period, case-control studies were undertaken on risk-factor analysis of low birth weight, and factors influencing the acceptance of tubectomy; one study involving in-depth interviewing was made of treatment-seeking behaviour among patients with cervical carcinoma. The students presented their findings to audiences similar to those faced by the first-year students.

Interns

Interns were encouraged to work on relatively difficult subjects, such as health administration and social factors in health and disease. So far a cross-sectional hospital study has been completed by two students on injections given unnecessarily to children aged under five years, and an observational/analytical field investigation has been made, also by two students, into inventory control of drug utilization at health centres.

Of 149 first-year clinical students who were questioned, 111 stated that they had gained substantially in terms of knowledge and skills as a result of being involved in research, presentations and discussions, and 100 expressed a favourable attitude towards research. Some
students pointed out that this approach to learning was relatively difficult, requiring considerable initiative and hard work. Among the benefits reported were:

- improved thinking and communication skills;
- awareness of the importance to be given to the details of disease management;
- improved knowledge of statistics and epidemiology;
- improved understanding of people's behaviour;
- development of a social outlook on health and disease.

It was suggested by the students that more time should be allowed for presentations and discussions, that the duration of projects should be reduced so that more students would be motivated to become involved, that the statistics classes of the main teaching schedules should be organized before research projects were undertaken, that teaching sessions should be held on the research topics before presentations were given, and that more projects should be conducted in rural areas.

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*Inadequate shelter*

Much of the housing in both the rural and the urban areas of developing countries lacks the most basic requirements for health. More than 2000 million people live in life-threatening and health-threatening housing and living environments. Most of the housing is overcrowded; space is nearly always at a premium, and many families live in one-room shelters or single rooms in tenements. Such overcrowding encourages the spread of acute respiratory infections, tuberculosis, meningitis, and intestinal parasites. Four or more persons to a room make it almost impossible to protect infants and children from burns or scalds and to store safely hazardous household substances such as bleach or kerosene. In urban areas a high proportion of housing is in illegal settlements and built of flammable materials; many dwellings are built on land prone to flooding, on steep hillsides or otherwise dangerous sites. The low commercial value of such sites means that the inhabitants have a greater chance of not being evicted.