

# **The Introduction of Epidemiology in Training Future Doctors: The Oman Experience**

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تركز جامعة السلطان قابوس على تدريب الأطباء العمانيين ودراسة الطب الإحصائي لما تتميز به هذه الدراسة من ضرورة احتياجية. فيتم التطبيق العملي أثناء التدريب الأكاديمي والتطبيقي.

ودمج الطب الإحصائي مع الدراسات التحليلية تساعد الطالب على التحليل والاستنتاج الدقيق للدراسات الإحصائية التي قام بها. فيشارك الطلبة مشاركة فعلية في هذه الدراسة. كما تقوم وزارة الصحة باتاحة الفرص لتعريف الطلبة على المشاكل الصحية والاجتماعية المنتشرة في السلطنة.

فالتنسيق المنظم والتطبيق الميداني في السنوات الدراسية تساعد وتحفز الطالب علي استيعاب الدراسة الإحصائية أثناء التطبيق العملي والدراسات العليا. الكلمات المرجعية: ادراك الحاجة، وبائيات، تكامل واحصاء.

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*This paper highlights the emphasis put on epidemiology in the training of future doctors at Sultan Qaboos University. It describes the special features of the teaching of epidemiology making it needs-oriented with continuous practical application in the field throughout the preclinical period. The students take an active part in planning field studies using their knowledge of epidemiology. Integration of epidemiology with statistics enables the students to analyze and interpret their own data thus obtaining a quick feed-back of the epidemiological studies conducted by them. They apply their knowledge of epidemiology to evaluate the data and formulate intervention programmes.*

*Close collaboration with the Ministry of Health provides an opportunity for the students to orient themselves with the important health problems of Oman and participate in the country's national programs. The scheduling of courses and continuation of application of epidemiology in the clinical years help to reinforce their knowledge of epidemiology and statistics for the clinical period and subsequent postgraduation.*

**Key Words:** needs-oriented, epidemiology, integration, statistics.

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## THE BACKGROUND

The Sultanate of Oman occupies most of the south-eastern corner of the Arabian Peninsula and has a coast line stretching for almost 1,700 kilometers. The total land area of the country is 300,000 square kilometers, with a population of approximately 1.8 million<sup>1</sup>.

The year 1970 was the beginning of renaissance of this country when the present Sultan, His Majesty Sultan Qaboos, took over from his father. In the last 25 years Oman has seen rapid development having taken education and health services to its villages<sup>2</sup>.

Sultan Qaboos University is the only university in Oman. It started with five colleges: Education and Islamic Studies, Science, Engineering, Agriculture, and Medicine. The latest addition is the College of Commerce & Economics. In September 1986, the first group of students was enrolled in the University which accepts Omanis who have completed their high school education.

The University, together with the Ministry of Health (MOH), had the responsibility of providing epidemiological information on some of the important health problems in the country. The College of Medicine felt the need of orienting the future doctors in the concepts and importance of epidemiology.

## THE CHALLENGE

As a response to the dramatic changes in the type of health problems faced today, many schools for the education of health professionals have felt the need to bring about changes in their curricula to make them more sensitive both to the health needs of the population and also to the education requirements of their students. The College of Medicine at Sultan Qaboos University, however, is a new Medical School; the first batch of students graduating in 1993 after a 7 year programme.

The College of Medicine realized that the training of medical graduates had to be needs-oriented with the development of "hands-on" skills

in the community. The entrants to the College of Medicine "adopt" a village. Each class relates with its "adopted" village throughout the period of their medical education<sup>3</sup>. Fortunately, the Dean and the Curriculum Committee appreciated the crucial role of epidemiology in the training of future doctors. The challenge facing the College of Medicine was to make the teaching **needs-oriented with practical application**, in which the Departments of Epidemiology and Medical Statistics, and Family and Community Health played an important role.

## THE TEACHING

The College of Medicine realized the need and benefits of integrating epidemiology and statistics as these two disciplines are interdependent. It also has the advantage of orienting the statistical component of the curriculum to the needs of future doctors. Therefore, a separate department of Epidemiology and Medical Statistics (EPISTAT) was established in the College of Medicine. In this day and age of computers, it is essential for medical graduates to be able to analyze and interpret data using statistical packages. Hence, a course in computers is a prerequisite for EPISTAT courses. This results in the use of computer sciences for better understanding of epidemiological findings. In addition to the integration of epidemiology, statistics, and computers, the teaching of epidemiology at Sultan Qaboos University has three special features: 1) early introduction of the discipline in the curriculum, 2) continuity of the application of epidemiology in the community, and 3) collaboration with the MOH.

The teaching of epidemiology is carried out through two didactic courses and four village health studies in the preclinical years. In the clinical years, the students are assigned to the various national health programmes of the MOH.

The class relates throughout its preclinical years through four village health care studies (one each year). The students spend the first two years (four semesters) studying Basic Sciences, English and Islamic Culture. However, epidemiology is



introduced as early as the end of the 1st semester, when the class carries out the first Village Health Care study (VHC 1) in their "adopted" village for a period of two weeks during the inter-semester break. Our experience has shown the feasibility of integrating health care into the undergraduate curriculum at an early stage. This has also been attempted in other countries<sup>4</sup>.

The first three days comprise of an intensive orientation into the concept and methodology of surveys. During this period the students are also given an introduction to the problem of hypertension followed by practical training in the measurement of blood pressure. Subsequently, for seven working days the students are involved in conducting a survey to obtain the socio-demographic profile of their "adopted" village, including information on the risk factors of hypertension. The students measure the blood pressure of individuals 15 or more years of age, and computerize their data. Initially there was an apprehension about the feasibility of training first year medical students in this aspect of clinical work within a period of two weeks. However, as found by Linder et al<sup>5</sup> that analysis showed a high correlation between the students' measurements of systolic and diastolic blood pressure and that of the supervisor.

The first course in Epidemiology and Medical Statistics (EPISTAT 1) is offered in the 3rd semester. This course emphasizes the concepts of epidemiology, sampling, and the types of epidemiology studies. The data obtained in VHC 1 are used to teach statistics. The students are, therefore, able to analyze the data obtained by them, and interpret the results. Problems for epidemiological studies also use data obtained in VHC 1. This not only makes the teaching of epidemiological and statistics realistic, but also enables the students to get a quick feed-back of the results of their own field work. The students use statistical packages for data analysis and interpretation in the practical classes.

At the end of the 3rd semester the students undertake the second field study (VHC 2) for two weeks during the intersemester break, in which

they apply their knowledge of epidemiology in working out the sampling strategy and the methodology. This field study deals with oral health. The students take an active part in assisting supervisors in the identification of oral health problems, and conducting health education programs. The students apply their knowledge of statistics in analyzing and interpreting the data.

During the third and fourth years (VHC 3 and VHC 4) the students have the opportunity to conduct well-planned epidemiological studies of important health problems in Oman. These studies are planned, implemented, and evaluated by the students with small group supervision. During the field work students assist the faculty in rendering health service to the community. They are also involved in formulating intervention studies based on the findings of their field projects.

The main emphasis of intervention programmes has been on health education. The students organize the health education programmes from inception to completion. They are responsible for producing and / or procuring the health education material, contacting the community and conducting the programme. In some cases the students have evaluated the programme through post intervention questionnaires. The students have also been involved in follow-up of referred cases to assess compliance and outcome.

The second course in Epidemiology and Medical Statistics (EPISTST 2) is offered in the 8th semester. This deals with regression analysis, establishing the validity of screening tests, clinical trials, life tables and life expectancy, standardization of rates, and the epidemiological approach to the organization, planning and evaluation of health services. The aim of this course is to equip the students for research during their clinical years and subsequent postgraduation.

Throughout the medical curriculum there is close collaboration with the MOH. In the preclinical years the MOH is involved in providing statistics on the health problems in Oman and participating in the village health care studies as

supervisors and facilitators. In the clinical years the students actively participate in the epidemiological aspects of control of diseases through the national programmes of the MOH for trachoma, community screening for eye disease, malaria, tuberculosis and diabetes.

The department of Epidemiology and Medical Statistics is now in the process of putting up a plan for an elective in Epidemiology and Medical Statistics in the internship period. This will be for the graduates who want to make epidemiology or research as their career options.

examination and practical classes. The class quizzes and written examination comprise of problem-solving questions predominantly. In the practicals, the students analyse and interpret data using the statistical packages.

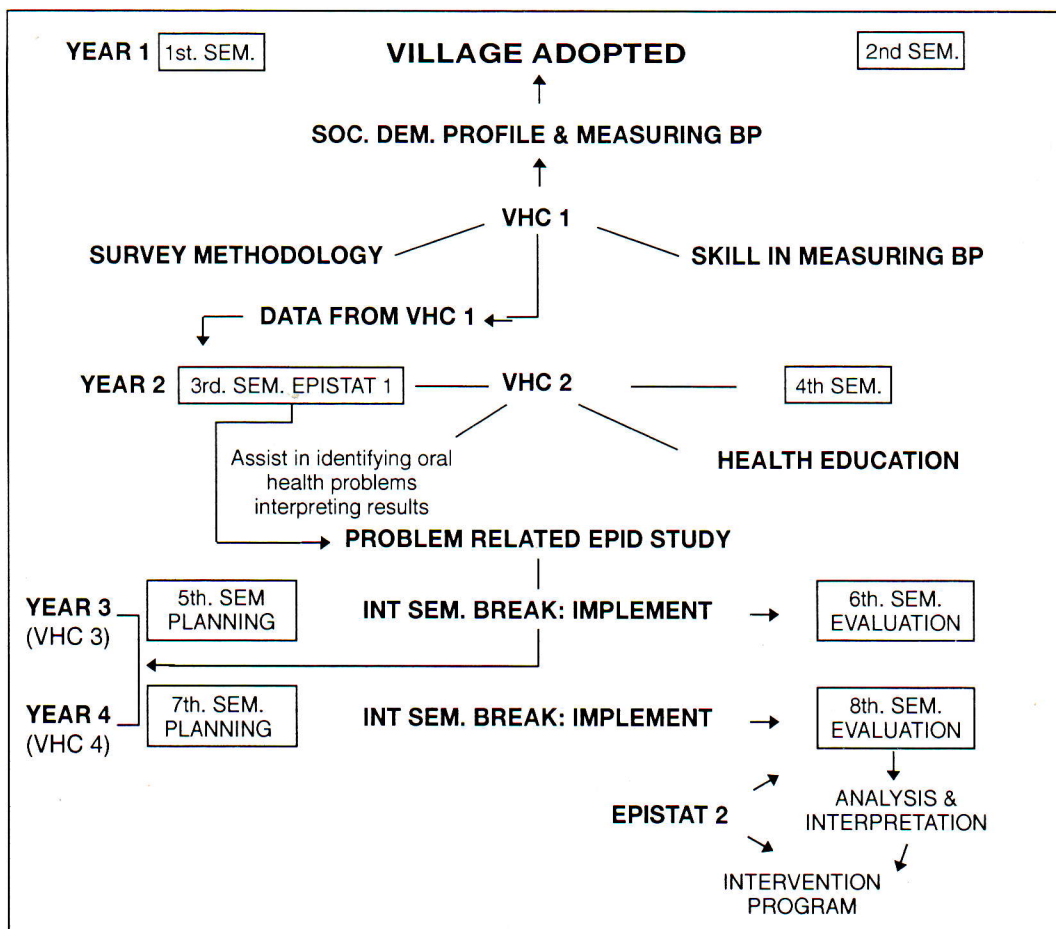
The application of epidemiology in the field studies has several components of evaluation. The students are tested in their ability to formulate questionnaires and conduct surveys. They are assessed on the computerization, analysis and interpretation of the field data. Finally, the students write up the project in the form of a dissertation.

## EVALUATION

For the two didactic courses, the students are evaluated through class quizzes, written

## CONCLUSION

The teaching of epidemiology at Sultan Qaboos University has some special features, which





emphasizes the importance given to epidemiology as an integral component of the training of future doctors at the Sultan Qaboos University.

The establishment of a separate department provides opportunities for flexibility and accountability. The discipline is introduced very early in the curriculum, integrating it with statistics. The students are not burdened with detailed formulae and their derivations in statistics. Having grasped the concepts and methodology, they use statistical packages to solve problems and interpret the data. There is constant application of epidemiological methodology in the community and hospital situations. The data used for statistics is real, and from Oman. Thus the students deal with health problems relevant to Oman, get a quick feedback and plan interventions accordingly.

As the future doctors will be involved with the major health problems in Oman, a close

collaboration with the MOH helps them in participating in the major prevention programs of the country. Last, but not the least, the teaching of epidemiology prepares the future doctors in conducting research during their postgraduate training and later in their career.

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