Teaching Community, Occupational and Family Medicine at the National University of Singapore: Past, Present and Future

ML Wong,[1,2] *MBBS, MPH, MD*, D Koh,[2] *MBBS, MSc (OM), PhD*, KH Phua,[2] *SM BA (Hons), PhD*, HP Lee,[2] *MSc (PH), MBBS, FFPHM*

Abstract

Introduction: We describe how the curriculum of community, occupational and family medicine (COFM) has evolved in response to social and educational forces and local health needs. Challenges in the teaching of the curriculum are also discussed. Curriculum: The COFM Department aims to produce medical undergraduates and graduates with the skills to critically appraise evidence, prevent and manage diseases, and promote health in the community and primary healthcare setting. Its teaching programmes consist of the medical undergraduate programme and the Master of Medicine programmes in Occupational Medicine, Public Health and Family Medicine. The undergraduate modules consist of evidence-based medicine, public health in the community, disease prevention and control, occupational medicine practice, health promotion and behaviour, and communication with patients. The university's first completely online module on SARS was jointly implemented by the Department and the Centre for Instructional Technology for the entire student population last year. The COFM curriculum has shifted from giving students factual information through lectures to developing students' critical thinking and problem-solving skills through small group teaching, case studies and community health projects. Innovative assessment methods such as open-book examinations; objective structured communication stations with simulated patients; and evaluation of students' participation in group work are used to assess students' skills in problem-solving, communication and teamwork respectively. Conclusion: While the Department has made significant progress in developing a relevant and updated curriculum based on appropriate learning and assessment approaches, it will strive to do more to develop students' critical thinking skills by using newer approaches.

Ann Acad Med Singapore 2005;34:102C-107C

Key words: Communication, Critical thinking, Evidence-based medicine, Open-book examinations, Problem-solving skills

Introduction

The Department of Community, Occupational and Family Medicine (COFM), previously the Department of Social Medicine and Public Health (SMPH), was inaugurated in 1948 as part of the King Edward VII College of Medicine, the forerunner of the National University of Singapore. The Department's mission is to excel in teaching, research and practice related to the causes, prevention and management of ill health in the community. It trains medical undergraduates and graduates in a range of skills ranging from the hard sciences of biostatistics, epidemiology and occupational medicine to the "soft" social, communication, management and behavioural sciences, so as to foster the development of a competent, holistic and compassionate graduate who is not only able to critically appraise evidence to prevent and manage diseases and promote health at the community level, but who is also able to communicate effectively with patients, community members and other healthcare professionals.

The Department's teaching programmes consist of the (i) medical undergraduate programme; (ii) Master of Medicine programmes in Occupational Medicine, Public Health and

[1] Assistant Dean (Education – Preclinical), Faculty of Medicine
National University of Singapore, Singapore
[2] Department of Community, Occupational and Family Medicine
National University of Singapore, Singapore
Address for Correspondence: Professor David Koh, Department of Community, Occupational and Family Medicine, Faculty of Medicine, National University of Singapore, MD3, 16 Medical Drive, Singapore 117597.

Family Medicine and (iii) graduate diploma courses in Occupational Medicine (Fig. 1). It also offers short courses on a variety of subjects in public health, occupational health and healthcare management.

In this article, we describe how the curriculum of community, occupational and family medicine has evolved over the years to meet the high standards of medical practice and the priority health needs of the population in Singapore and other countries. Challenges in the teaching of our disciplines in the future are also discussed.

Early History: Curriculum from 1948 to 1986

In the early days, before the Department was set up, public health was taught by senior government health officers on a part-time basis in the medical school. Then, the teaching of public health focused on hygiene, sanitation and infectious diseases. In 1936, (Col) Dr John William Scharff, who was lecturing on public health, introduced a health and sanitary survey of rural villages as part of the curriculum. The Second World War interrupted medical education from December 1941 until 1946. The Department of Social Medicine and Public Health was established in 1948, with the appointment of Dr John H Strahan as its first professor (Fig. 2). From 1949, the curriculum was broadened to include undergraduate teaching in nutrition, medico-social work and biostatistics. A nutrition unit was formed with the transfer of nutrition field workers from the Department of Biochemistry in 1949 and the presence of a lecturer in applied nutrition from 1950. A medical statistician was appointed in 1952 and this enabled a statistical consultative service for medical research work to be developed.[1]

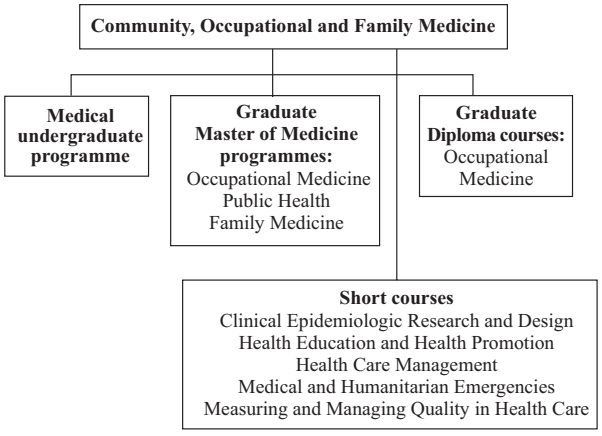

Fig. 1. Teaching programmes in the Community, Occupational and Family Medicine Department.

In 1953, the Department, with assistance from the World Health Organization, introduced the Diploma of Public Health (DPH), the first diploma course offered in postgraduate medicine in Singapore (Fig. 3). This was replaced by the Master of Science (Public Health) and Master of Science (Occupational Medicine) degree courses in 1973. Occupational medicine was introduced to the curriculum in the fifties, when Professor Trevor Lloyd-Davies, an industrial physician, became Professor of Social Medicine and Public Health. Curriculum development in occupational medicine was further strengthened with the appointment of Professor Phoon Wai On, an occupational health physician, as head in 1970. Subsequently, the Department was designated as a World Health Organization Collaborating Centre in Occupational Health, with Professor Jerry Jeyaratnam appointed as its Director.

In 1987, when the teaching of Family Medicine was introduced into the curriculum, the Department was renamed the Department of Community, Occupational and Family Medicine (COFM).[2] The Department was reorganised into five divisions, namely Epidemiology, Biostatistics and Health Informatics, Health Care, Occupational Medicine and Family Medicine, to allow for greater development in the various fields.

The Current Curriculum: Content, Structure and Delivery

In 1998, the Faculty of Medicine, National University of Singapore revised its medical undergraduate curriculum in

John H Strahan 1948-1953 | TA Lloyd-Davis 1953-1961 | Winnifred Danaraj 1961-1964 | Michael J Colbourne 1964-1969 | Phoon Wai On 1970-87 | Lee Hin Peng 1987-2001

Fig. 2. Past Heads of Department.

Fig. 3. The Department's first batch of Diploma of Public Health graduates, 1953/1954.

response to the recommendations of the General Medical Council (GMC), United Kingdom, which were published in *Tomorrow's Doctors*.[3] Essentially, the revised curriculum stressed the development of a core curriculum that all graduates must know, and problem-based and discovery learning. It also gave more emphasis to the teaching of family medicine so that medical undergraduates gain more of their clinical experience from outpatient clinics and general practice. In addition, the GMC document reaffirmed the importance of public health, reflecting its growing relevance in the planning of medical services, disease control and health promotion. The curriculum in the COFM Department was hence revised in line with the broader objectives of the Faculty of Medicine undergraduate curriculum. The main features of the COFM undergraduate and graduate programmes are described below. As the undergraduate programme constitutes a major component of the curriculum of the Department, it is described in greater detail.

Undergraduate Programme

The COFM undergraduate programme aims to produce medical students with the skills to critically appraise evidence, prevent and manage diseases, and promote health at the community level. The course is taught in the second and third year of the 5-year medical course. The modules and postings are shown in Figure 4. The Year 2 programme consists of modules on evidence-based medicine, public health in the community, disease prevention and control, occupational medicine practice, health promotion and behaviour, and communication with patients. A range of teaching methods such as lectures, tutorials, small group problem solving exercises, role play and personal work are used to help students acquire information and skills from the above modules. The Year 2 curriculum also includes cross-departmental teaching. For example, the teaching of epidemiology is integrated into the module on infectious

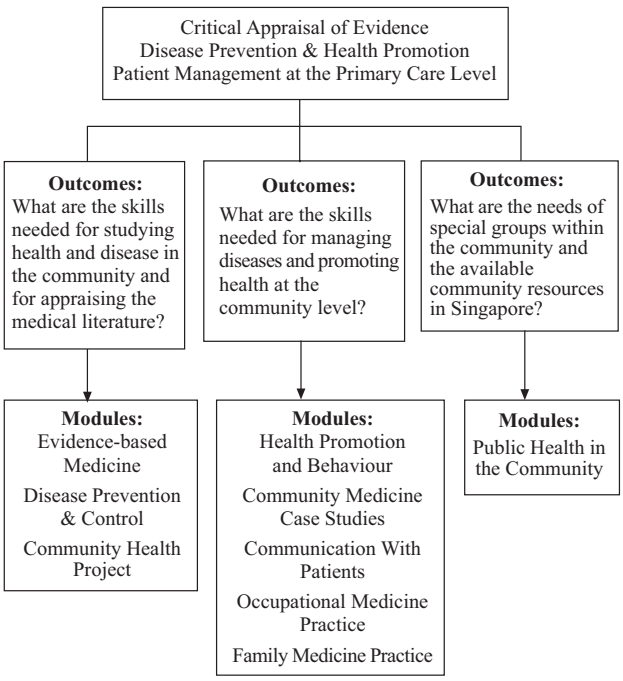

Fig. 4. Overview of the undergraduate course in community, occupational and family medicine (Adapted from Chia SE: Core Clinical Curriculum for Medicine Years 3 to 5: Community Occupational and Family Medicine, 1999. Singapore: Faculty of Medicine, 1999[8]).

diseases, coordinated by the Department of Microbiology.

The Year 3 programme includes a community health project, a community medicine case study, and family medicine. The 3-week community health project provides students with opportunities to work as a group to conduct surveys on problems commonly encountered in clinical practice, perform statistical analysis, apply and integrate knowledge from modules taught in Year 2 to address health problems identified from their surveys, use information technology, and give oral presentations on their findings. Over the past few years, students have conducted studies on important health problems such as peripheral arterial disease, myopia, menopausal symptoms, chronic rhinitis and headache among handheld cellular telephone users. The findings from some of these studies have been published in international peer-reviewed journals and used by various national bodies.

The community medicine case study requires students to conduct an in-depth 3-month follow-up study of a patient who is discharged from hospital so that they can understand and identify the medical, behavioural, occupational, socio-cultural and home environmental factors influencing his or her illness and outcome.

In 2002, the family medicine module was expanded to provide medical students with more ambulatory, outpatient clinical experience and practical experience in community medical services. Emphasis was given to students' acquisition of communication, consultation and counselling skills. The 2-week module was extended to 4 weeks, with 2 weeks' attachment at the general practice clinics and 2 weeks' attachment at polyclinics and community-based healthcare organisations, with a day-attachment to a paediatrician so that students have more opportunities to acquire knowledge and skills in the practice of family medicine in the context of the child, the adult and the elderly.[2]

Tutorials for modules such as occupational medicine, public health in the community, and health promotion and behaviour are also conducted in Year 3, when students have started their clinical postings. The tutorials in occupational medicine are based on case studies of patients likely to be encountered in primary healthcare practice so that students can apply the principles learnt in their lectures to actual clinical problems, and hence integrate learning into the framework of their ultimate goal – clinical practice.[4] The staff and student responses to the tutorials have been very positive.[4]

Recently, the Department jointly implemented, with other departments, 2 innovative faculty-led programmes – the longitudinal Professional Development and Communication programme in 2003 and the Research Skills Foundation Course in 2004 respectively. The objective of the former is to develop students' attitudes and professional behaviours that are appropriate to their future responsibilities to patients, colleagues and society in general. Students are taught ethics, communication, empathy and team-building skills so that they learn to be more compassionate and are able to work effectively in interdisciplinary teams to provide humane and professional care to patients. There are plans to integrate this programme into the clinical postings, so that communication skills and professional behaviour will be taught throughout the 5 years of medical training.

The Research Skills Foundation Course aims to equip students with basic skills in clinical and epidemiological research and biostatistics. The long-term goal of this course is to help students master the analytical skills required to practise scientific medicine, and to stimulate their interest in clinical and life science research in response to the national need for excellence in biomedical and life science research.

Methods of Assessment

The assessment methods have to fit into the assessment

Table 1. Modules and Assessment Methods of the COFM Undergraduate Curriculum

Module	Assessment method
Public health in the community	Modified essay questions
Disease prevention and control	Multiple-choice questions; closed- and open-book examination
Evidence-based medicine	Modified essay questions; closed- and open-book examination
Health promotion and behaviour	Modified essay questions; closed- and open-book examination
Occupational medicine practice	Multiple-choice questions; closed- and open-book examination
Communication with patients	OSCE (objective structured clinical examination)
Community health project	Oral presentation; written report; participation in class discussion; observation of students' attitudes by tutors; peer evaluation of professional behaviour and attitudes
Community medicine case studies	Oral presentation; individual case study reports
Family medicine	Log book; case reports; multiple-choice questions; closed- and open-book examination

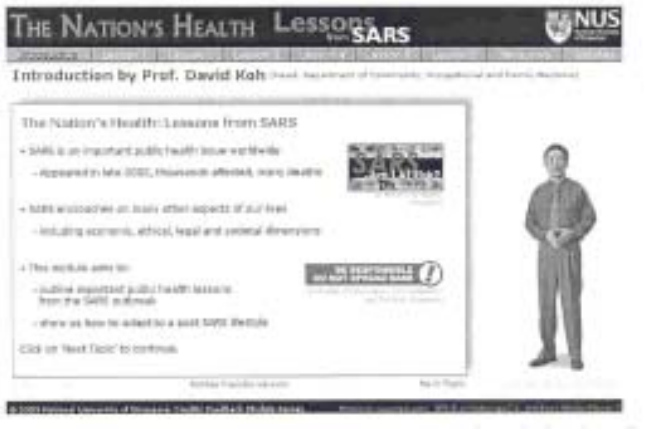

Fig. 5. Professor David Koh, Head of the Department introducing the online module entitled "The Nation's Health – Lessons from SARS".

methods favoured by the faculty and they have to be closely matched to learning outcomes. Depending on the type of modules, teaching methods used and expected learning outcomes, a wide range of assessment methods are used (Table 1). These include modified essay questions, multiple-choice questions, open book examinations, objective structured clinical examinations, oral presentations, project reports, peer evaluations and case study reports. The Department is the only one in the Faculty of Medicine with an open-book examination.

Monitoring the Quality of the Course

All modules are monitored by obtaining regular qualitative and quantitative feedback from students. The undergraduate committee and module coordinators also meet regularly to discuss student feedback of the modules, identify problems and find ways to improve teaching activities. The Department's teaching has been ranked among the top in the faculty. In addition, 4 (25%) of the 16 full-time staff have received teaching excellence awards over the past 5 years.

Graduate Programmes

Since its early beginnings in 1953, the graduate courses in public health have evolved to become the modularised Master of Medicine programmes in Occupational Medicine and Public Health in 1992. The teaching of public health was broadened to incorporate chronic disease epidemiology, family health, ageing, healthcare management and health economics. Progressively, the course has been modularised to enable more popular subjects to be offered as short courses for wider participation. The Master of Medicine (Family Medicine) course was introduced in 1993. The graduate diploma courses in occupational medicine introduced in the late nineties provide further training for physicians who deliver healthcare to the working population and the family.

Table 2. Trends in the Teaching of Community, Occupational and Family Medicine in the Undergraduate Curriculum

Past	Present
Teacher-centred	Student-centred
Didactic lectures	Problem-based, skills development
Discipline-based	Integrated learning
Closed essay questions	Open book examinations, projects
Assess knowledge	Assess core knowledge, professional attitudes, skills and behaviour

Graduates from these courses have occupied top health leadership positions such as Director General of Health in various countries in the region, such as Hong Kong, Indonesia, Malaysia, Brunei, Philippines – and internationally, in organisations such as the World Health Organization (WHO).

E-learning Module on Public Health

In August 2003, the Department, acting with the support of the top management of the National University of Singapore, developed and implemented an online 6-lesson module on public health, entitled "The Nation's Health – Lessons from SARS" for the entire population of 32,000 undergraduates and graduates. The objective of this module was to increase students' awareness of SARS; its clinical aspects, treatment, and preventive measures at personal, community, national and international levels; and the socioeconomic, ethical and legal issues pertaining to the disease. The Department developed the multidisciplinary module within a short period of 2 months by getting technical expertise from the University Centre for Instructional Technology and by mobilising the Department's multidisciplinary team of academic and adjunct staff as well as academic staff from other departments. It was the university's first completely online module, which was accessible to all students via the Integrated Virtual Learning Environment (IVLE) (Fig. 5). It was also the first broad-based credit-module that was offered to all university students regardless of the course they were taking.

Almost all (92%) of the entire student population had read the e-module within 10 months of its implementation. The module has received very good student feedback. The majority (66.7%) reported that the contents of this module can best be learnt by the current e-learning format and half (50.4%) would recommend the module to other university students. The majority (75% to 85%) also found the lessons useful and easy to understand. The team won a university-level Special Commendation Award for developing the module.

Discussion

Main Features of the COFM Curriculum

The COFM curriculum is continually evolving to respond to changes in educational goals and health problems in Singapore and internationally, and to meet the needs of students and recently qualified doctors. Over the years, the emphasis in our curriculum has shifted from giving students factual information through lectures to developing students' critical thinking and communication skills to manage health problems in the community, occupational, and primary healthcare setting (Table 2).

We have also adopted more rigorous and innovative assessment methods such as open-book examinations to assess students' ability to apply knowledge to solve common health problems, and the objective structured clinical examination (OSCE) with simulated patients to assess students' communication skills. The traditional written examinations that assess mere memorisation of facts have been reduced. Students' professional attitudes and behaviours, such as teamwork and participation in group discussions, are also assessed when they work on their community health projects.

Future Challenges

As health problems become more complex, being increasingly subject to a myriad of factors, it may no longer be effective to teach students from any single discipline. The integrated problem-based approach may be more appropriate in training students to manage such problems at the individual and family level as well as in the community or occupational setting.[5] Our Department, comprising many disciplines ranging from family medicine, occupational medicine, economics, biostatistics and epidemiology to social and behavioural sciences, is well-positioned to adopt the integrated teaching approach. It is also likely that the COFM curriculum will be increasingly integrated with other basic science disciplines as well as other clinical disciplines.

Small-group teaching, which facilitates participation, problem solving and learning, will probably constitute a major proportion of teaching methods in future. For small-group teaching to be effective, tutors have to be well trained. There is also a need to plan and recruit a sufficient number of dedicated and enthusiastic tutors, and to monitor the quality of teaching. This may pose a challenge if there are large student numbers without a corresponding increase in human resources. The Department will have to think creatively to maximise the use of teaching staff and to use resources efficiently to cope with the huge administrative workload in planning and monitoring the teaching programmes.

The field of community, occupational and family medicine is expanding rapidly, as seen by the recent marked increase in knowledge arising from the emergence of new infectious diseases such as SARS, and recent developments in areas such as molecular epidemiology. In 1905, the clinician and teacher William Osler remarked, "To cover the vast field of medicine in four years is an impossible task. We can only instill principles, put the student on the right path, give methods, teach how to study, and to discern early between essentials and non-essentials."[6] His words ring true even today. It is not possible to teach students everything about community medicine/public health, particularly when information is changing and evolving rapidly. What we can do is stimulate students' interest, cultivate in them an attitude of intellectual curiosity, and use innovative teaching activities to stimulate them to continue with self-directed learning.

In conclusion, the Department of Community, Occupational and Family Medicine has made significant progress over the past 5 decades in developing a relevant and updated curriculum based on appropriate learning approaches and rigorous assessment methods. Nevertheless, as medical education worldwide places an increasing focus on community-based education, small-group teaching and the fostering of students' critical thinking skills,[7] we have to do much more to help our students develop these broad skills, and to develop the academic staff's interest and skills in using effective teaching methods. As educators and role models, we must critically examine ourselves and strive to deliver our best to train students on high standards in the practice of community, occupational and family medicine. We owe it to our students, society and ourselves.

REFERENCES

1. Polunin I. History of the Department of Social Medicine and Public Health 1948-1965. (Mimeographed), 1965.
2. Goh LG. Undergraduate education in family medicine. Singapore Fam Practitioner 2001;27:25-7.
3. General Medical Council. Tomorrow's Doctors. Recommendations on Undergraduate Medical Education. London, England: GMC, 1993.
4. Koh D, Chia KS, Jeyaratnam J, Chia SE, Singh J. Case studies in occupational medicine for medical undergraduate training. Occup Med 1995;45:27-30.
5. Lee HP. Public health medicine training in Singapore. Asia Pac J Public Health 2000;12(Suppl):S6-S7.
6. Osler W. After twenty-five years. In: Osler W. Aequanimitas With Other Addresses to Medical Students, Nurses, and Practitioners of Medicine. Philadelphia: Blakiston; 1905:197-215.
7. General Medical Council. Tomorrow's Doctors. Recommendations on Undergraduate Medical Education (Revised edition). London: GMC, 2002.
8. Chia SE. Core Clinical Curriculum for Medicine Years 3 to 5: Community Occupational and Family Medicine, 1999. Singapore: Faculty of Medicine, 1999.