PRIORITY HEALTH PROBLEMS IN MEDICAL EDUCATION

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This series includes meeting documents, internal reports, and preliminary technical documents that may later form the basis of a formal publication. A Manuscript Report is given a small distribution to a highly specialized audience.

La présente série est réservée aux documents issus de colloques, aux rapports internes et aux documents techniques susceptibles d'être publiés plus tard dans une série de publications plus soignées. D'un tirage restreint, le rapport manuscrit est destiné à un public très spécialisé.

Esta serie incluye ponencias de reuniones, informes internos y documentos técnicos que pueden posteriormente conformar la base de una publicación formal. El informe recibe distribución limitada entre una audiencia altamente especializada.

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Priority Health Problems in Medical Education

Network of community-oriented educational institutions for Health Sciences Task Force II

Final report
November 1990

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INTRODUCTION

Task Force II, otherwise known as Priority Health Problems in Medical Education, was established by the Network of Community-Oriented Educational Institutions for Health Sciences in 1984. The primary goal of the Network as stated in May 1983 is:

> to assist health science educational institutions who are committed to academic programs which focus on the health problems of individuals in the community in which the institution is located. This population perspective includes the descriptioon of the state of health (burden of illness) of the community or society, the particular populations at risk, the factors which predispose individuals to ill health, and the factors and interventions which benefit health.

The Task Force was active from early 1985 until September 1989 when it presented a final report at the Network's biennial meeting in Kerkrade, Netherlands. The goals of Task Force II were:

- To develop analytic tools to help the faculty of health sciences educational institutions to identify the major health problems of the region served by them and to display these in prioritized, scientifically valid and understandable fashion.

- To develop strategies for incorporating this analysis of priority health problems into the curricula of medical schools.

Task Force Membership

Dr. Victor Neufeld (Chair)	Associate Dean of Education, Faculty of Health Science, McMaster University, Hamilton, Canada
Dr. Chitr Sitthi-amorn	Director of Clinical Epidemiology Unit, Chulalongkorn University, Bangkok, Thailand
Dr. Kerr White	Consultant in Health Services Research, Stanardsville, Virginia, U.S.A.

McMaster Advisory Group

Dr. Peter Tugwell	Chair, Department of Clinical Epidemiology and Biostatistics
Dr. Ron McAuley	Professor, Department of Family Medicine
Dr. John Chong	Assistant Professor, Department of Clinical Epidemiology and Biostatistics

The Problem

Medical schools in both the developing and developed world are confronted with the challenge of educating physicians and other health professionals who will contribute to a reduction of the burden of illness in the populations they serve. In accepting this challenge educational institutions may face the following obstacles:

- Health data for a given region may be difficult to find or, if it is available, it may not be displayed in a manner which is useful for educational planning.
- The burden of illness in a given region may not have been scientifically analyzed to determine which conditions or problems are most amenable to intervention by physicians or other health professionals.
- Medical school faculty may not have the analytic perspective, skills or willingness to consider data which identifies community health needs when developing and implementing a curriculum.
- The implementation of curriculum change will require both an understanding of the behaviour of large organizations and strategies for change within them, and must include systematic plans, expertise and resources to evaluate its effects, particularly when the curriculum change is intended to alter the burden of illness in a population.

Project Development

In order to accomplish the Task Force goals the Network's Project Planning Committee contacted approximately twenty health education institutions around the world with an invitation to appoint a fellow to participate in the project.The intention was to recruit about six fellows from a mix of institutions, geographically, in terms of age, i.e. new and established, and from both developed and developing countries. In addition, the committee looked for institutions attuned to the Task Force goals as evidenced by an existing curriculum that attempted to respond to local health needs and a definite plan for curriculum change. The Committee criteria also required the institution to assign a fellow with established credibility as a clinician or researcher who would have sufficient standing to implement the project. Some difficulties did arise in recruiting fellows, principally an unfavourable political climate in several of the countries contacted, an inability of institutions to free faculty for the lengthy study blocks, unsuitable timing in that some institutions had recently made major curriculum changes, and financial restraints. Despite these difficulties eleven medical schools responded positively to the invitation and six of those appointed fellows: McMaster University, Canada; Suez Canal University, Egypt; Tampere University, Finland; Gadjah Mada University, Indonesia; Ilorin University, Nigeria; and Chulalongkorn University, Thailand.

Schedule of Activities

Initial Conference in Bellagio, Italy	November 1985
Preparation in Home Institutions	Dec. 1985-Mar. 1986
Study Block 1 at McMaster University	Apr. 1986-July 1986
Pilot Testing Curriculum Strategies	Aug. 1986-Apr. 1987
Site Visits	Nov. 1986-Feb. 1987
Study Block 2 at McMaster University	May and June 1987

Second Review in Home Institutions	July-September 1987
Conference in Pattaya, Thailand	September 1987
Study Block 3 at McMaster University	May and June 1988
Conference in Kerkrade, Netherlands	September 1989

SUMMARY OF ACTIVITIES 1985–1989

Initial Preparation

The Bellagio Conference, Italy,
November 1985

Fellows and deans from the six participating institutions met to discuss the goals and lay the groundwork for Task Force activities during the following two years.

Preparation in Home Institutions

Dec. 1985 to March 1986

Fellows consulted appropriate faculty in their respective institutions about changing curriculum to reflect high priority health problems, critically assessed health data and its availability, developed research projects to be based on health data collected and analysed with the assistance of medical undergraduates, and investigated research funding.

Study Block 1

McMaster University, Hamilton, Canada
April to July 1986

Objectives:

- To provide fellows with the analytical skills and methodology for critically appraising health data and assessing the burden of illness in their communities.
- To teach the principles of planning adult education and curriculum development.
- To develop a framework for incorporating the analysis of priority health problems into medical curricula.

Each fellow attended weekly seminars and tutorials, special presentations and discussions with selected McMaster faculty and worked with a faculty advisor familiar with the home institution. In addition a three-day invitational workshop was held which included guest speakers and seminar leaders from international agencies as well as university faculty. Over the course of the study block each fellow developed a project to be carried out at his own institution. The projects and action plans were presented at an invitational conference which also discussed Task Force progress and future activities.

Study Block 1 ended with an evaluation meeting attended by fellows, advisors and the McMaster Planning Group. There was strong support from representatives of all institutions for the general approach to reorienting priorities in health sciences education. All agreed that the diversity of the fellows' background, experience and expectations provided a unique and valuable contribution.

Some valuable constructive criticism included comments indicating a need for improved continuity and integration of discussion topics, less emphasis on certain topics such as burden of illness and more emphasis on principles of education and process of curriculum change.

Each of the fellows returned to his home institution with a definite plan judged practical, appropriate and to have a good chance of success. This included goals, a clear timetable and plans to meet with appropriate members and groups in the home institution such as the Dean, Curriculum Committee and the department chairmen.

Site Visits
Nov. 1986 to Feb. 1987

During the period of fellowship work at the home institution one or more of the project team members made a site visit to review progress with each fellow and faculty steering committee, to provide consultation about the next steps and to participate in a faculty retreat. This provided an opportunity to strengthen or reaffirm institutional support and to engage the interest of appropriate external personnel e.g. government health officials, other medical school faculties, other health professionals.

McMaster Study Blocks 2 and 3
May and June 1987, May and June 1988

The second and third study blocks followed the format of the original, each ending with a three-day invitational workshop in which fellows presented their work for discussion. Additional site visits were made by the faculty advisors who reviewed the implementation of the various projects.

CASE STUDIES

Canada
McMaster University

Fellows:	Dr. Peter MacDonald	Dept. of Family Medicine (1985–87)
	Heather Craig, B.Sc.	School of Nursing (1988–89)
	Dr. Scott Garner	Div. of Rehabilitation Medicine, Chedoke-McMaster Hospitals (1988–89)
	Dr. Stephen Landis	Faculty of Medicine (1988–89)
Dean:	Dr. Stuart MacLeod	Faculty of Health Sciences
Advisors:	Dr. Kerr White	Consultant in Health Services Research, Virginia, U.S.A.
	Dr. Walt Rosser	Chair, Department of Family Medicine

Background

McMaster University, one of the oldest universities in Ontario, moved in 1930 from Toronto to Hamilton, an industrial city of about 300,000 located at the southwest tip of Lake Ontario in the heart of the province's prime industrial and commercial region. In 1969 the University founded an innovative medical school that featured problem-based, small group, self-directed and student-centred learning. This became a Faculty of Health Sciences in 1974 with the inclusion of the older School of Nursing. The degree of Bachelor of Health Sciences in Occupational Therapy and Physiotherapy was added in 1981.

The undergraduate medical programme at McMaster focusses on the study of health care problems from the outset. Knowledge of the basic science disciplines is acquired in an integrated fashion around clinical problems, first problems on paper but also in the early stages by the introduction of both authentic and trained, simulated patients. A broad approach to problems considers not only biologic but also behavioural and population health factors. Problem-solving skills are the essence of the McMaster approach to learning. Students need to become more than a simple repository of information. They need technical, analytical and communication skills, an understanding of their own attitudes, biases and limitations, a caring approach and a broad grasp of and sympathy for the human condition in order to deal with all aspects of a patient's problem.

In the tutorial group setting students contribute to each other's education under the guidance of a tutor. Since students are responsible for their own learning and require different information at different times, few lectures are given, thus time is allowed for independent, self-directed learning. There are no formal examinations, however there is continuous evaluation involving problem-based exercises and assessment by tutors, peers and the students themselves. Since the University believes that the careful selection of prospective students is vital, the admission process is intensive and based not only on academic status but also on personal qualities including the ability to work as part of a team.

The M.D. curriculum comprises six units, an elective programme and revision time within a three year period. This is only three months shorter than the traditional four year programmes of other schools that include summer holidays. Unit 1 provides an introduction to the programme emphasizing a global view of the determinants of health and illness. Students look at concepts and information from population, behavioural and biological perspectives and begin to acquire basic learning skills, critical appraisal skills and clinical skills. Students become familiar with the health care system in the Hamilton region. Units 2-4 concern human structure, function and behaviour organized around organ systems as follows: Unit 2: cardiovascular, respiratory and renal systems; Unit 3 (6 wks): hematologic, gastroenterologic and endocrine systems; Unit 4 (4 wks): neurologic, locomotor and behavioural systems. Unit 5 is organized around the life cycle. Major themes include reproductive health, child and adolescent health, occupational and environmental health and geriatric health. Opportunities exist to study clinical problems in a variety of health care settings. Unit 6 is the clerkship. The clerkship consists of rotations in medicine and surgery, family medicine, psychiatry, pediatrics, and obstetrics and gynecology, and in elective time half of which must be spent in clinical medicine.

The compulsory components take place in teaching practices and in the five teaching hospitals in Hamilton. Students participate in the direct care of patients and the management of health and illness. All health care problems are actual patients. Students may use their elective time for activities using local, regional or distant resources. The responsibility for planning appropriate electives to meet their own learning objectives rests with each student in collaboration with his or her advisor. Blocks of six weeks after Unit 3, four weeks after Unit 4 and 16 weeks in the clerkship are built into the curriculum for full time elective activities. In addition there are entirely voluntary 'horizontal' electives which may be undertaken concurrently with other parts of the curriculum.

Students may also make arrangements to devote from six to twelve months in the pursuit of special academic experiences, often after Unit 5 or in the first half of Unit 6. The intent is to encourage students to explore possible careers in special 'frontier' areas of medicine and health care such as research training and experience, community health projects or international health opportunities.

Regulations for Licence to Practise

In order to practise medicine in Canada university graduates in medicine must hold a certificate from the College of Physicians and Surgeons of the province in which they intend to practise. The College of Physicians and Surgeons of Ontario issues certificates enabling the final year student in an Ontario medical school to take the Medical Council of Canada examinations. After passing this examination the graduate must complete one year of acceptable postgraduate experience in a hospital approved by the College of Physicians and Surgeons before being licensed to practise.

Task Force Activities

The first fellow, Dr. Peter MacDonald, used the Measurement Iterative Loop (Tugwell P. et al. *J. Chron. Dis.* 1985;38:339–351) as a framework for organizing health related data and incorporating the analysis into an educational planning system.

He also conceived and refined with the other Task Force fellows a strategy for determining the priority of health problems based on community health data. Termed the PIC (priority illness and conditions) scoring system, this analytic tool was tested on data from the Hamilton-Wentworth regional municipality. It is a weighted system based on prevalence, reliability of diagnosis, severity of the burden of illness, urgency and effectiveness of available treatment, and preventability.

Dr. MacDonald produced a paper in conjunction with colleagues titled Setting Educational Priorities for Learning the Concepts of Population Health that was published in *Medical Education* 1985;23:429–439. The paper is reproduced here as Appendix A with the permission of the editors. It describes the use of the loop and the PIC analytic tool in detail. Raw data were collected from the following sources: one year of encounter data from eight local community practices, including the four teaching family practice clinics associated with McMaster University, mortality and morbidity data based on hospital separations from four local teaching hospitals and Canada Health Survey data. As in other Task Force countries, researchers found they were hampered by a lack of standardization in data entry coding systems which necessitated some editing of data.

After the priority health problem list was compiled, Dr. MacDonald compared it with items from the Priority Problems and Conditions Questionnaire survey conducted by Dr. J. P. Chong and associates in 1984. In this survey educators in the clinical clerkship unit had presented their ideas about what illnesses and conditions should be priorities among medical students. All of the health problems in the PIC list appeared among the priority items in the survey results. The list of problems ascertained with the PIC analytic tool was also compared to the list of problems used in the McMaster undergraduate medical curriculum.

Certain curriculum changes occurred in Unit 5, the Task Force's focus for the first study block. In consultation with the Unit Chairman the fellow expanded the Unit 5 handbook to place more emphasis on a population-based approach to health care problems. Also added was a section on determining the priority of an illness from a medical education standpoint. Although the handbook included the PIC scoring system,

the list of priority health problems was omitted as being too directive and thus contravening the philosophy of self-directed learning.

Dr. MacDonald also worked on the design of a Measurement Iterative Loop (MIL) worksheet. The first part is a case history taken from a patient that the student has to seek out and examine independently. The major portion comprises 28 questions exploring the student's knowledge of concepts implicit in the MIL with respect to the particular patient who has been examined, such as burden of illness, causation, comunity effectiveness and health care considerations. Though not all questions will apply to every case study, they invite a broader focus than has previously been used in the McMaster programme. The third part is a tutorial group critique of the student's presentation of the case. The Loop Worksheet encourages students to seek out individuals as a basis for their case history and polish their history-taking, physical examination and case presentation skills. The exercise was expected to lessen clerkship anxiety which unit planners perceived as a major problem in Unit 5.

An analysis of data from completed Loop Worksheets was conducted to determine how much students had learned about the concepts of the MIL and on what basis they selected health problems for case study.

Dr. MacDonald designed a questionnaire for Unit 5 tutors to determine their reactions to the Task Force II invitational workshop and to elicit comments about further faculty development, particularly regarding the MIL and its use in a population-based approach to priority health problems.

Lessons Learned

The advisors' site evaluation was highly favourable, particularly with respect to the students' adoption of the Measurement Iterative Loop and broader societal concepts in completing the worksheet exercise. A recommendation was made that the concept of MIL be applied in Unit I so that it could be internalized early and carried through into other units.

All those involved in the Task Force activities realized the paucity and inappropriateness of much of the available health statistics, especially estimates of unmet need from household surveys, but also ambulatory care and hospital statistics. Data from Hamilton-Wentworth surveys provided more timely local information but the major limitation of differing and often inappropriate classification systems remained.

One solution discussed to surmount the difficulty of unmanageable data was the use of reliable non-local quantitative data for the purpose of extrapolating to one's own jurisdiction. Students would learn to deal with the problems of standardization, extrapolation and denominators in order to make suitable adjustments from other sources to local demographic patterns and use several sources to validate estimates. They would distinguish between persons and visits or admissions, between the volume of provider activity and persons suffering or served, and between patients served by a practice and the general population.

A handbook that had been prepared coincidentally with Task Force activities listed and critically appraised available sources of local health care statistics. Advisors suggested the development of a reference library based on many of the sources referred to in the handbook, and incorporating international data such as the United Kingdom's National Morbidity Survey and Hospital Activity Analysis, and the Continuous Morbidity Registration Sentinel Stations reports from the Netherlands. They also recommended greater use of financial data readily available from hospital accounting departments and the Ontario Hospital Insurance Plan (OHIP) to establish reliable estimates of direct costs.

Another curriculum change discussed was the possible introduction of the labelling, nomenclature and classification schemes for health statistics in the International Classification of Primary Care by Oxford University Press.

Study Block 3 of Task Force II in May and June 1988 was unique in that it included for the first time a nursing fellow, Heather Craig from the McMaster School of Nursing. Ms. Craig examined the adaptability of the priority health problem concept and PIC analytic tool to the nursing curriculum. She determined that the formula for establishing priorities of health problems allows a shift in emphasis appropriate to each specific health profession. A high priority problem for the nursing curriculum would have a high burden of illness and high likelihood that nursing intervention could reduce that burden. While nursing is interested in and must be knowledgeable about physiologic impairment, the unique contribution of nursing lies in its ability to intervene around functional impairment.

Ms. Craig prepared a report for the Chair of the B.Sc.N. suggesting utilization of the Task Force concepts to re-evaluate health problems used in the nursing curriculum and eliminate redundancy. In the curriculum content she recommended that closer attention be paid to the nursing role in health problems with the physiologic material taking an essential but background role. The following is an example of this redesigned content.

Uncomplicated Hypertension

Background	population data: incidence, prevalence definition contributing factors: causation clinical manifestations/sequelae basic anatomy/physiology basic knowledge: e.g. pharmacologic prescription(s)
Foreground	factors affecting compliance advanced knowledge of non-pharmacological prescriptions(s) • teaching/learning • compliance enhancement • diet management • smoking cessation primary prevention counselling

Dr. Stephen Landis and Dr. Scott Garner participated in Study Block 3 with Ms. Craig developing and critiquing ideas relevant to curriculum planning both in face-to-face meetings and via electronic communication.

Dr. Landis together with fellows Pisonthi Chongtrakul from Thailand and Amr Hassan from Egypt developed and completed a telecommunications project by computer conferencing: a prototype integrated learning module on Sexually Transmitted Diseases (STDs). The module is based on the MIL and seeks to integrate some important concepts about the biology, epidemiology and cost-effective management of STDs. It has been tested and incorporated within the medical curriculum.

Dr. Landis and Dr. Chongtrakul also worked together to produce a handbook on antimicrobial pharmacology targeted to the twenty highest priority infectious problems identified for their respective communities. A problem-based module incorporating MIL concepts, the handbook was designed to streamline student learning about antimicrobial pharmacology.

In concert with several other fellows Dr. Garner studied the various approaches toward setting local priorities on health problems used by institutions taking part in Task Force activities. He also worked on a study comparing societal treatment of the disabled internationally. He looked at the incidence and prevalence of disability, the roles of government, medical professions and medical curriculum and described how disabled people fit into the community in terms of their activities, housing and vocation.

Next Steps

The Faculty established a Health Priorities Analysis Unit to centralize data and provide a focus for further study within McMaster.

Egypt
Suez Canal University

Fellows:	Dr. Amr Hassan	Faculty of Medicine, Internal Medicine
	Dr. Hesham Elsayed	Faculty of Medicine, Pediatrics
	Dr. Medhat Kamal El-sayed	Faculty of Medicine, Pharmacology
Dean:	Dr. Esmat Ezzat	Faculty of Medicine
Advisor:	Dr. Ron McAuley	Dept. of Family Medicine, McMaster University

Background

Suez Canal University was established in 1978 in a massive redevelopment of the Suez Canal area. The population of the area, divided into five governorates, is approximately two million.The Faculty of Medicine, Suez Canal University (FOMSCU) was established as a community-based educational programme in direct contrast to Egypt's nine existing medical schools, which operated on a conventional western or European model stressing didactic learning and oriented to tertiary care. FOMSCU developed as a pioneering endeavour to address the problems of medical education in the country and to collaborate with the health services authorities— largely the Ministry of Health—in upgrading health care delivery in the fast-growing Suez Canal and Sinai regions. A strong working relationship exists between the Faculty of Medicine and Ministry of Health since all health care facilities used by the university are run by the Ministry. A central body, "The Permanent Committee for Health Services and Medical Education in the Suez Canal Area and Sinai" coordinates and oversees the collaboration.

The faculty's five institutional goals are:

- to qualify physicians whose primary objectives will be to provide health care in a combined hospital-community system with major emphasis on primary care
- to relate medical education to the needs of the socicty so that physicians will be able to diagnose and manage community health problems
- to develop and implement with the Ministry of Public Health and other health care delivery bodies, an integrated system for comprehensive health care delivery and health manpower development in the Suez Canal Area and Sinai, taking into consideration present and foreseeable limits to health care expenditure. The regional health service facilities will be used as the locus for education and training.
- to develop and provide post-graduate training and continuing education for health personnel
- to develop research programmes that primarily address the health needs of the community

Accordingly, an innovative programme was developed, characterized by an integration of biomedical, clinical, behavioural and community health sciences within a format of problem-based, student-centred learning, in which the bulk of educational activity takes place in community settings. Learning is triggered by indivi-

dual and general population health problems and the realities of health care delivery in rural communities. The six-year curriculum comprises three phases: the first (Year I) being a series of blocks organized around phases of growth from conception to old age that include structural, functional and psycho-social characteristics together with societal and environmental factors relevant to health and illness. Training is given in communication, basic clinical skills and field survey and research methodology, which continues in the following years. The second phase (Years 2 and 3) integrates the bulk of the biomedical sciences into the study of individual and community health problems. The third phase (Years 4, 5 and 6) consists of clerkships, in ambulatory care settings for the first year, then afterward primarily in hospitals with the exception of the primary care clerkships. Year 4 does include a 9-week-long attachment to the out-patient department of a general hospital as one of the ambulatory settings. Learning takes place in small groups throughout the curriculum, even during the clerkship phase when students consider written problems weekly, either predesigned or derived from their field work.

Field Work

Students are affiliated to one of 10 rural or 8 urban primary care health units in groups of from two to four for two days each week throughout phases I and II and for 8- or 9-week blocks in phase III. The health units, which are located in Port Said, Ismailia and Suez governorates, belong to the Ministry of Health and are run by regional health directorates. Students engage in the whole range of functions of the health units(promotive, preventative, curative and administrative) with increasing responsibility, yet under the supervision of health unit personnel and of field tutors from the university's clinical and community medicine faculties. In their fourth year, students rotate between occupational health clinics within factories and insurance scheme clinics dealing mainly with industrial workers for a 9-week attachment. Students learn family health care starting in the second year by being assigned as a male-female duo to a group of families with the support and supervision of primary care physicians and specialists. In all at least 35 per cent of the scheduled study hours in the curriculum are spent in field work.

During each of the six years, an entire student cohort plans and conducts a community health project, directed in phases I and II at community diagnosis and in phase III at intervention. Projects mainly address perceived priority health problems such as surveys of parasitic diseases or community needs such as the development of a blood bank service. During their fourth year, small groups of students plan and implement a study that they conduct during the 6-week-long elective period. This can be either a laboratory-based or field-based study related to a priority health problem. All components of field work are subject to evaluation. Skills are assessed by pass/fail checklists and knowledge by modified essay, problem-solving formats.

Field work is under the control of a faculty committee with wide representation from virtually all disciplines including the basic science faculty. Regional directors administering the extensive programme locally are coordinated by a central director affiliated to the Dean of Medicine's office.

Several international teams have evaluated the programme in addition to periodic review by the Faculty of Medicine and to a study evaluating the first cohort of medical graduates in 1987.

Problems

Community health problems singled out for study in the curriculum were identified by an assessment of available data from the Central Agency for Public Mobilization and Statistics, published and unpublished data from the Ministry of Health, and some area hospital and health unit records. The community medicine department carried out additional surveys in selected areas of three governorates of the five served by the university.

Both availability and quality of data pose serious problems for the development of an appropriate curriculum. Data are mainly utilization records from primary and secondary care hospitals; recording is incomplete and sometimes unreliable: there is no standard classification for diagnoses (and diagnoses are not always validated by investigation); information on age and sex distribution is often lacking; births and infant deaths are under-reported, and causes of death are unreliably recorded.

Aside from data inadequacy, there has been no consistent, systematic scheme for choosing which health problems to focus on in teaching. The second aspect of problem-based learning, i.e. decisions about what interventions physicians should be taught, has also been problematic. Interventions, including all possible preventative, promotive, diagnostic and curative steps, need to be balanced by the benefit versus harm that accrues to the individual and community, taking economic, social and cultural considerations into account.

Task Force Activities

Collaborating with department coordinators, the fellows have conducted a survey of current problems used in the curriculum matching them with an analysis of high priority health problems in Egypt. Faculty members provided information on the causes and risk factors, diagnostic measures and effective, efficient interventions for each problem, with appropriate support for their decisions. They also specifically identified activities at the primary care level. This information formed the objectives of each problem and became a guide for evaluating students. The fellows developed a form to facilitate the process using the concepts of the measurement iterative loop.

Focussing on the need for a systematic method of selecting health priorities, the fellows refined the analytic tool developed by the Task Force for use by FOMSCU. The following are examples of the order of priority of some infectious diseases as evaluated by Dr. Hassan:

1. tetanus
2. acute diarrhea and diphtheria
3. pulmonary T.B. and hepatitis
4. typhoid and conjunctivitis
5. meningitis
6. encephalitis and measles
7. pertussis
9. influenza, malaria and pueperal sepsis
10. chicken pox
11. mumps

The long-term goals are:

- to develop more coordinated, reliable student surveys which can be used as the foundation for an accurate data base by the faculty and the Ministry of Health, and

- to encourage more reliable reporting of health data in health care facilities by defining and teaching the necessary methodology.

To these ends the fellows have channelled their efforts into the Faculty's development of a Clinical Epidemiology Unit, established in 1988.

In 1985, Task Force advisors Dr. Peter MacDonald, and Dr. Ron McAuley, both from McMaster University, conducted a critical appraisal workshop for more than 20 faculty members in Ismailia and at that time identified a nucleus of faculty interested in the establishment of a C.E.U. unit. In 1986 that group

conducted a workshop on research design for fellow faculty and graduate students. Suez Canal University was collaborating at the same time with the University of Illinois at Chicago in an innovative venture which allowed twelve FOMSCU physicians to earn masters' degrees in health professions education from UIC's Centre for Educational Development. All but the final two months of studies were conducted on site in Egypt. These activities meshed with those of the Task Force since both were aimed at the development of expertise and methodology to improve curriculum design.

Dr. Elsayed, the second Task Force fellow, completed the Design, Measurement and Evaluation programme at McMaster University in 1987. Dr. Medhat completed the same programme in 1988.

In addition, Dr. Elsayed has prepared a paper for possible publication: "The Role of Student Health Surveys in Health Planning".

Lessons Learned

A major ingredient in the success of Task Force involvement with Suez Canal University was the commitment of key medical faculty who were strong believers in community orientation from the outset, and provided active support for Task Force objectives. The participation of fellows in DME training at McMaster as part of the INCLEN programme probably reinforced their commitment by strengthening and/or providing skills necessary to successfully complete their projects.

Finland
University of Tampere

Fellow:	Dr. Mauri Isokoski	Dept. of Public Health
Dean:	Dr. Heikki Vapaatalo	Faculty of Medicine, Jan. 1985–Dec. 1986
	Prof. Amos Pasternack	Faculty of Medicine, Jan. 1987–Dec. 1988
Advisor:	Dr. Ron McAuley	Dept.of Family Medicine, McMaster University

Background

The University of Tampere is located in the southern region ofFinland in one of the country's five major cities. Finland has a population of about five million, 60 per cent of which is urban.The greatest consumers of health services are people over the age of 75, a rapidly growing sector of the population.

The medical faculty of Tampere University was founded in 1972 when the country's primary health care system was reorganized. Curriculum planning was based extensively on primary health care and on a task analysis of such physicians in comparison to general practitioners in eighteen other western European countries. Analysis showed that the Finnish health centre doctor has a wider variety of tasks than colleagues in the other countries studied, with a greater emphasis on disease prevention and health promotion. In Finland the general practitioner undertakes maternity and child health care, school health care, occupational health care and health system administration.The number of doctors in primary health care has increased three- or four-fold since 1972, thus health promotion can be stressed, and there is an opportunity for curriculum planning to be based on community health risks in addition to lists of priority diseases.

Traditionally the licensed MD has had the right to practise privately or in public service. In 1970 general practice became a specialty like any other with a similarly arduous five-year training period. When the health care centre concept was adopted in 1972 the general practitioner became a leading member of the managerial team and the need arose for further training and curriculum change in the Tampere medical faculty.

Every medical graduate must work for at least six months in primary health care before registration. One third of graduates will work permanently in primary health care centres. Fifty per cent of all graduates will obtain specialist training and thirty per cent will participate in a doctoral programme. Medical training consists of traditional lectures with examinations.

Major long-term goals for the Finnish health care system, as offered by Professor Hannu Vuori of the WHO, are to change the focus from the burden of illness to holistic health, by concentrating on health promotion and continuing, comprehensive care rather than on medical treatment of separate, episodic cases of illness.This would require that doctors act not independently but as part of a health team with an emphasis on general practice instead of on specialization. This health team would ideally include the patient who would take increased responsibility for maintaining his or her health and a more active role in regaining it. Patients' individual involvement in health care would be matched by community participation (particularly in reducing risk factors). A physician's responsibility for health care would thus require collaboration with other sectors.

Sources of generally reliable statistics abound from government agencies responsible for social services such as short and long-term disability pensions and sick leave payments, and from hospitals and physicians in primary health care.

Certain problems with data must be taken into consideration. For example statistics taken from cause of death are based on the last complications of diseases, thus pneumonia may be misclassified as a basic cause of death. Deaths due to bronchitis, emphysema and asthma, primarily males, often share smoking as a common major contributing factor, which could be addressed. Similarly, lung cancer is the most prevalent form of cancer and smoking is the most important risk factor.

Statistics describing cases in which Finns in the work force are granted temporary or permanent disability pensions are based on the primary diagnosis, which may underestimate broad underlying factors such as alcoholism. Cerebrovascular diseases are included in cardiovascular diseases. Geriatric and pediatric cases are of course not included in this data base.

Statistics based on hospital discharges, which are reported to a central registry, refer to hospital episode. This tends to underemphasize such problems as mental illnesses where hospitalization may be lengthy but infrequent and emphasize such things as neoplasms where there are frequent shorter episodes of hospitalization.

Statistics based on a national household survey though including people of all ages and both within and outside the labour force under-represent problems which residents are uncomfortable in revealing, again such as mental illness.

Priority problem areas identified by a variety of criteria included, in alphabetical order, accidents and suicides, cardiovascular diseases, locomotor organ diseases, mental diseases, neoplasms and respiratory system diseases.

Dr. Isokoski's study revealed certain shortcomings in data collection as discussed, yet he concluded that biases could be allowed for in curriculum planning and corrected by the use of ad hoc studies. For example he concluded that minor psychiatric illnesses are under-estimated in all statistics. A special study made in

two areas of Finland showed that about 30 per cent of the population suffered from minor mental disorders. He also stressed the necessity of setting different goals for geriatric care and care of younger age groups, an important consideration in Finland where population increase is due more to people living longer than to childbirth.

Task Force Activities

The Fellow, as chairman of the school's curriculum committee, collaborated with key professors who had responsibility for the curriculum study modules to ensure that topics corresponded with the highest priority health problems as discerned from national data. The first two years of the medical curriculum cover Biomedical Sciences; Public Health is studied throughout the five years, and Clinical Medicine in Years 4, 5, and the first half of year 6. The faculty also formed a task force to reorganize the programme, extending it from 5 1/2 to a full 6 years.

Problems perceived by Tampere Medical Faculty

- students' lack of interest in social and behavioural sciences
- overemphasis on lectures and group work with insufficient scope for independent learning
- poor attendance at lectures
- too many examinations
- an unsuitable sequencing of study modules which put the main module of primary health care before the pediatrics and gynecology modules for one-third of the students

Proposed solutions

- introduction of problem-based learning
- introduction of new integrated modules of priority health problems in primary health care based on burden of illness and task analysis
- reduction of lectures; encouraging and allowing more time for independent study by introducing a 12th semester, which would also allow improved sequencing of modules
- replacement of some examinations with other forms of evaluation

The general portion of the study manual was rewritten using the MacMaster manual as a model.

Dr. Isokoski researched and prepared a report on Finland's priority health problems from government insurance, pension and hospitalization statistics. A Finnish national survey of households taken in about 1972 to identify chronic diseases was also used. Data shortcomings were examined as discussed above, and methods of incorporating such data into curriculum planning were considered.

An elective module on critical appraisal was introduced in September 1987.

The Faculty held a seminar on curriculum planning with participants from other medical achools, the Ministry of Health, Ministry of Education, National Board of Health and the Task Force advisor from McMaster University.

Tampere University withdrew from the Task Force in 1987, since by that time Dr. Isokoski had achieved his main goals within the Task Force.

Indonesia
Gadjah Mada University

Fellow:	Dr. Rossi Sanusi	Faculty of Medicine
Dean:	Dr. Radjiman	Faculty of Medicine
Advisor:	Dr. C. H. Goldsmith	Professor of Biostatistics, McMaster University

Background

The Gadjah Mada University is located in Yokyakarta, the sole municipality in the special region of Yogyakarta, which comprises four districts with a total population of 2.5 million. Almost all Indonesian medical school graduates must fulfill a two to five year public service posting in the country's community health centres as part of the government's commitment to the improvement of rural health. Thus, one major objective of the Gadjah Mada medical programme is to prepare graduates for this community health role, teaching students epidemiology and health programme management.

The medical school at Gadjah Mada University incorporates as part of its curriculum a community-oriented medical education programme (COME) in which students play an intimate role involving them in data collection, problem-solving and report-writing. The original COME programme comprised two 15-week semesters in each of the first four years and four weeks in each of the two internship years. Students in each first semester took part in tutorial groups to learn problem-solving skills and survey methods, and to review medical literature preliminary to developing research proposals for field testing at one of the health centres in the province's 70 subdistricts. Groups comprised 10 students and one tutor, 10–15 groups in all.

Simulated PSLE (problem-solving learning experiences) in the first three semesters examined the following priority health concerns:

- acute infections (I and II)
- nutritional disorders
- parasitic diseases
- chronic infections
- non-infectious diseases

In the second semester of Year 1 students collected field data, using survey instruments of their own making, which, together with WHO surveys and Indonesian statistics, were used to develop a catalogue of local high priority health problems. In subsequent second semesters students determined the etiology and risk factors for the priority health problems, provided community level intervention working with community leaders, and in the fourth year provided medical care to individual patients in local settings. The fifth and sixth years of the programme, an internship at health centres, district hospitals and the provincial hospital focussed on an evaluation of health care programmes: efficacy of therapy, cost effectiveness, and efficiency of programme-delivery in the planning of effective health services.

Task Force Activities

The fellow, Dr. Sanusi, worked closely with COME administrators to review, evaluate and enhance the programme, providing greater tutorial content and changes to the evaluation procedures. These changes took into account the modified instructional objectives (i.e. problem-solving in determining the high priority diseases in a community, identifying the important risk factors and selecting the appropriate effective community interventions) and also considered the desirability of evaluating students' efforts in groups or individually in relation to the types of tasks performed.

The inequality of student contributions to group work, a concern expressed by tutors and students alike, necessitated a thorough examination of group dynamics and teaching arrangements, and formed the basis for a paper by Dr. Sanusi, "Overcoming Student Social Loafing in the Community Oriented Medical Education Programme of the Gadjah Mada University School of Medicine". Task Force activities also contributed to the development of "module handbooks" for problem-based learning.

A tutorial workshop was organized and held as a faculty development project with colleagues from several Network countries participating. This was in response to a recognized need for faculty retraining in tutorial methods and evaluation mechanisms.

Lessons Learned

Students gave generally positive evaluations of the revised programme. They are able to collect suitable data and comment on the appropriateness of various therapies for handling health problems in the community.

Problems requiring attention have been in:

- introducing students to the independent learning style
- promoting equal effort, particularly with a blanket grading system
- developing consistency in tutoring
- ensuring quality control in field work and utilization of field data
- providing an adequate reference library from which to select problems for PSLE

In response, Dr. Sanusi has encouraged the following solutions:

- assigning specific tasks to individual students at each stage and increasing the comprehensiveness of modules and tests
- providing tutor training workshops and increased feedback to tutors through regular evaluation
- developing the module workbooks
- expanding the reference library
- increasing supervision by tutors and Health Care Centre doctors
- instituting reliability and validity exercises with regard to student surveys and supporting the publication of results

Next Steps

The arrangement of the COME programme described above began in 1985. As the programme has been closely examined and refined the challenge of integrating epidemiology and programme management with the basic and medical sciences has become more evident. To answer that challenge a committee at work during the 1989-90 academic year is developing a Community Based Education (CBE) programme that will use community health care centres and activities for the teaching of relevant individual and community health care. Students will gain experience in all levels of the health care delivery system, however the greatest involvement will be at the subdistrict level. Building on the COME programme and with the close involvement of Dr. Sanusi, task forces are developing learning modules, constructing testing instruments, developing tutor training and additional training for faculty, building up a skills laboratory and making preparations with community health centres. A future goal is a health information system to reduce, store and retrieve data produced by the university and the health care delivery system. The university will retain a strong role in preparing students for their exposure to CHCs: acquiring clinical knowledge of integrated, disease-oriented blocks, and analyzing and learning relevant problem-based scenarios through lectures,

seminars, individual consultations and independent study. Using audio-visual aids, fellow students and simulated patients, students will be able to practise skills in communication, physical examination, therapeutic intervention, laboratory work and computing.

Nigeria
University of Ilorin

Fellow:	Dr. Michael Adedoyin	Faculty of Medicine
Dean:	Dr. Olatoye Ogunbode	Faculty of Medicine
Advisors:	Dr. Nancy Edwards	(1987–June 1988), Faculty of Health Sciences, McMaster University
	Dr. Elizabeth Alger	(July 1988—), New Jersey Medical School, University of Medicine and Dentistry of New Jersey

Background

The University of Ilorin is located in the capital of Kwara State, in the southwestern part of Nigeria. Economic, social and health indicators place the country among the developing nations. Although the university is in a city of 750 000, the medical school relates to a population that is primarily rural and has limited access to health care. The doctor-population ratio in Nigeria stands at 1:20 000. Up to 75 per cent of Nigerians live in rural areas whereas up to 80 per cent of the scarce medical personnel practise in urban areas.

The University of Ilorin Medical School was established in 1978 in response to an expressed national need for doctors with a great sense of service and strong orientation to broad community health care and preventive medicine. The educational philosophy and curriculum were developed during planning workshops the same year. Founding faculty were drawn from diverse backgrounds in developed and developing countries. Today they remain dedicated and creative in pursuit of the institutional objectives they devised.

High on the list of qualities that the founding faculty wished for the graduate was the ability to identify and assess the health needs of a community and to plan and implement a programme to improve its health that would take into account all the relevant characteristics of the community. This philosophy made the university most receptive to the idea of priority health planning.

In contrast to Ilorin, the thirteen other medical schools in Nigeria operate traditional programmes that concentrate on didactic learning with occasional tutorials. At Ilorin the curriculum provides an integrated approach to the preclinical disciplines that emphasizes active learning through problem-solving. Students are provided with integrated clinical experiences throughout: the focus is on learning by doing, taking responsibility for patient care and making an active contribution to the health of the community. Each medical school in Nigeria is presently expected to operate through its teaching hospital two Comprehensive Health Centres (CHC). This provides the opportunity to train health professionals at a level relevant to primary health care while rendering services at the grassroots level.

The key feature of Ilorin's curriculum is the COBES (Community- Based Experiences and Services) programme. This places groups of 20–24 students in four villages with CHCs for four weeks during each of their 1st, 2nd, 4th and 5th years. Junior students operate under the supervision of senior students. Faculty are drawn from all disciplines and accompany students in their postings. Core COBES health professionals provide health care at the site when students are not in the field.

Objectives for first year students include gaining a basic appreciation of the determinants of community health, carrying out community health studies, and presenting the results to a joint conference of university and Ministry of Health officials. Activities for second year students relate to that year's WHO theme and focus on community diagnosis and intervention strategies within the resources of the community. Where applicable, the prevalence, morbidity/mortality, and the economic and social consequences of each condition are explored. In a similar fashion to first year, the students analyse and present the data they have gathered.

Upper level students are progressively involved in health service delivery, providing prevention programmes and care for patients coming to primary care clinics, under the supervision of clinic doctors. However, 4th year students are still encouraged to study the community health problems and learn more about the ecology of disease. Students in the 5th year are essentially interns operating at a highly clinical level.

The COBES component represents 11 per cent of the students' five year training period. Not included in this percentage is an eight-week Epidemiology and Community Health posting.

The COBES programme continues to evolve under the leadership of Dean Ogunbode and with commitment from key faculty, especially Dr. Adedoyin who serves as the programme coordinator. An additional four weeks have recently been given to COBES and a mini-library has been provided at each site. The importance of the programme to communities is reflected in the construction of hostels, some by local labour, to house students and faculty during COBES postings.

Task Force Activities

The University of Ilorin Medical School has participated in Task Force II since 1986, with Dr. Adedoyin taking over from a previous fellow in mid-1987. Priority health problems for the Kwara State were determined from data collected from the State Ministry of Health, the district health units and the University of Ilorin Teaching Hospital. Using a formula that takes into account epidemiological and clinical factors, a Health Priority Index was developed. Among the 20 most frequently occurring diseases were:

1. malnutrition
2. gastroenteritis
3. malaria
4. anemia
5. road traffic accidents
6. measles
7. respiratory infections
8. hypertension
9. tuberculosis
10. obstetric problems

Important in this analysis was the recognition that the data represent utilization of health resources and thus may not reflect the real burden of illness in the community. Patients with those or other conditions may not seek medical attention or may use alternative methods of treatment. Second, potential sources of error were also apparent in the reliability, accuracy and validity of the vital statistics. For example, although the above table shows the top ten priority health problems in Kwara state, there are other less common but also important diseases that must be addressed either because of the morbidity they impose or because of the easy availability of effective, efficient methods of treating or eradicating them. These diseases include guineaworm, tetanus, onchocerciasis, schistosomiasis and cacx. Guineaworm can easily be eradicated by providing adequate potable water, and tetanus by good immunization coverage.

An important conclusion reached was that the state needs a better health information system, and that a closer relationship between the state Ministry of Health and the University is highly desirable if the medical curriculum is to respond to priority health problems.

Each of the clinical departments is now in the process of determining the priority health problems in its discipline based on mortality /morbidity records, taking into account the prevalence and incidence, morbidity and mortality, treatability and preventability, and the ease with which the disease is spread. The 'product moment' approach was used to produce a final score or Priority Health Index for each disease. Analyses have been completed for the departments of Child Health, Obstetrics and Gynecology, and Internal Medicine. These departments have adjusted the exposure of students to various topics to reflect the priority problems and are preparing tutorials for interactive learning about these problems. The remaining departments are still ranking health problems using the analytical tool developed by Dr. Adedoyin, after which the faculty will complete more major curriculum changes.

Students in COBES postings have also completed surveys to determine the priority health problems in their respective communities. Not surprisingly, these lists are quite different from ones based on hospital utilization data. More importantly, however, the feasibility of such student surveys has been demonstrated. This has led to a pilot study in which students conducted surveys to rank health problems in a village of about 300 people then undertook specific intervention to reduce the burden of illness.

Results

Task Force II activities have made the following impact on the University of Ilorin medical curriculum: didactic lectures have been reduced by at least 20 percent in every department in favour of small group tutorials; the idea of ranking health problems to guide curriculum content is fully accepted; the COBES programme has been expanded and the faculty's learning resources are being improved.

In all, eight other medical schools within Nigeria have actively participated in workshops held at Ilorin and there is a good indication they will review their curricula. Three medical schools that participated in 1988 are already converts to the philosophy and are becoming community-oriented.

Lessons Learned

- Prioritization of health problems is feasible and can lead to improvements in medical education and in the health care service. However, inadequate health information and health information systems can be a major constraint in ranking health problems. For planning purposes health information must be improved.

- Student health surveys undertaken during COBES postings can make a contribution to health information if carefully planned and supervised. Limitations exist because data are drawn from a small population and perhaps cannot be extrapolated to represent an entire region. With an expansion of the programme to more sites and ideally a combined effort of the faculty and Ministry of Health this limitation can be overcome.

- Many other institutions have viewed with interest the COBES programme and have been attempting to duplicate Ilorin's community-based medical education.

- Communication with colleagues has been an essential component of the project's success whether by electronic mail, for example in seeking help with difficult problems, or simply in the exchange of ideas during workshops.

Next Steps

- Ilorin will pursue improvements in student-centred problem-based learning. Tutor training is foremost on the agenda.
- The COBES programme will continue to be the basis of the faculty's efforts in relevant community health care education.
- The possibility of interprofessional training in COBES will be explored with the state government. An aim which the faculty wishes to pursue is the establishment of data bases at the COBES sites.
- The university will pursue the idea of collaborating with the state government to set up a Health Priority Analysis Unit. The use of student survey data would make such a unit feasible. In 1987 the Faculty of Health Sciences was designated as a WHO collaborating Centre for purposes of community-based research and manpower development. It is hoped that such collaboration will assist Ilorin in its discussions with the Ministry of Health about future co-operation.
- The university will expand its attempts to field test the validity of the Priority Health Problems model in the design of a) medical education programmes and b) health services projects.
- Ilorin will continue to motivate other medical schools to become community-oriented.

Thailand
Chulalongkorn University

Fellow:	Dr. Pisonthi Chongtrakul	Faculty of Medicine
Dean:	Dr. Charas Suwanwela	Faculty of Medicine
Advisor:	Dr. Peter Tugwell	Faculty of Health Sciences, McMaster University

Background

Chulalongkorn University, situated in Bangkok, Thailand's capital, has traditionally emphasized the need for a classical medical training adhering to international standards. Beginning in 1979, greater emphasis has been placed on the modification of curriculum to give it greater national relevance. A community medicine programme was significantly modified in which students were assigned to villages visiting families and peripheral community health services and were apprenticed as well to selected health centres and hospitals. Students also worked with mobile medical and health survey teams. The programme tended to operate in isolation from other medical sciences and clinical medicine programmes with limited faculty involvement.

Rationale for Change

The 5th National Medical Education Conference organized by the Thai Medical Council in conjunction with medical schools, the Thai Medical Council and Chulalongkorn Faculty of Medicine itself, in evaluating the country's medical education, raised questions about the relevance of curriculum content and about medical graduates' critical thinking skills, wisdom, sense of proportion and humanitarian qualities.

A prime factor was thought to be the emphasis on fact-based learning, which promotes memorization rather than the development of reasoning powers and the critical skills needed for continued independent learning. Fact-based learning becomes more problematic as specialized knowledge expands putting increasing pressure on students and on faculty attempting to maintain international standards, perhaps at the expense of humanitarian qualities. These agencies also identified the need for modification of curriculum to serve national manpower requirements and reduce inequities in the accessibility of all citizens to adequate medical attention.

The general goal envisioned by the above agencies was an expansion of the medical graduates' role to include health centre administration, primary health care support and ongoing research in addition to the traditional role of doctor.

Task Force Activities

Task Force II built upon the initiatives of a new medical education track using an approach called the Community Targeted Problem-Based or CTPB medical curriculum. The Task Force initiative constituted only one component of a restructuring that encompassed admission policies, evaluation methods and clinical and pre-clinical teaching, including curriculum content and methodology. Dr. Chongtrakul worked closely with the planners in launching the new CTPB programme, which operates parallel to the existing traditional programme and to the Medical Education for Students in the Rural Area Project (MESRAP). The university plans to incorporate experience gained from the three programmes to form a new hybrid curriculum.

The basis for development of the CTPB was priority health problem data available from such government agencies as the Division of Statistics, Division of Epidemiology and Ministry of Public Health, demographic, socio-economic and disease forecasts from the same ministry's Division of Health Planning, hospital statistics, local and foreign journals, reports from foreign agencies in Thailand such as the U.S. Armed Forces Research Institute of Medical Sciences (AFRIMS), SEAMEO-TROPMED, bibliographical records from the Museum and Reference Centre, population census and vital statistics and data from non-governmental agencies.

The following series of blocks organized around the various body systems was created and priority health problem-based scenarios developed for each block:

- accidents and trauma
- infectious disease
- psychological
- malignancies
- growth and nutrition
- reproductive health
- environmental and occupational
- degenerative and aging
- immunological process

A committee was organized for each block to identify the essential knowledge for each problem-based scenario in consultation with, and validated by, each clinical department. In developing a list of priority health problems faculty applied the measurement iterative loop (see Appendix A) and compared the findings with local experts to obtain consensus on current problems. Where opinions differed the experts interviewed agreed to abide by MOPH data.

Community survey data available at the outset of CTPB was not used initially since methodology was not deemed to be consistently rigorous. However, community leaders in Klong Toey (an urban slum) were

consulted in a small pilot project. Diarrhea and respiratory diseases in children were used as a model to test community co-operation and participation. Local health centres responsible for Klong Toey were involved to test the feasibility of referrals and technical collaboration between them and the university hospital.

Priority health problem-based scenarios on infectious disease were introduced first to third year students in the Pharmacology Department.

The use of small group tutorials, rare in the traditional curriculum, has increased and has received favourable student evaluations despite the alienism of open discussion within a cultural tradition of deference to superiors.

Computer-assisted evaluation was introduced and used by 90 per cent of students. Students also responded favourably to the use of microcomputors for problem-solving exercises.

Faculty has generally approved of the extensive changes in teaching methods, however some have reservations about the adequacy of detailed content in CTPB. Other departments within the medical school have expressed interest in introducing the new approach to their curricula.

Lessons Learned

It is reassuring that the current CTPB includes diseases such as dengue haemorrhagic fever and malaria, which have topped a recent health survey, as well as known prevalent problems such as drug dependence, respiratory tract infection, tuberculosis and diarrhea. Yet uncertainty remains about some routine statistics reported through the health service system. Hospital data, based on patients presenting with symptoms, may be skewed by several factors: levels of health care that are accessible, reputation of health centres, interest of personnel, transportation difficulties, and client perception of the seriousness of their problems thus their need to seek treatment.

Data collected by community survey is potentially subject to error, particularly when the survey's objective is to pinpoint the prevalence of specific ills rather than to rank all community health problems. Quantifiable indicators of disease prevalence such as healthy days of life lost are difficult to measure. Methodology is not standardized, nor can it be when equal diagnostic tests are not always available. Data on the prevalence of risk factors, important in promoting health, are seldom collected. Not all people at risk may participate in the screening process, particularly bearing in mind transportation difficulties, or some problems may be seasonal. All these factors underline the importance of using several sources of data: routine statistics, periodic validation surveys, discussions with community leaders, relevant case studies and delphi technique rather than relying on any single survey.

Next Steps

There is a need for the Faculty of Medicine to implement some form of tutor training and to secure additional commitments from faculty members for continuation and expansion of the CTPB programme. It is expected that the programme will expand to include clinical and community experience pertinent to the block activity in order to maximize students' exposure to real situations as distinct from problem scenarios.

By offering the three medical programmes side by side, i.e. the CTPB, traditional and rural-oriented MESRAP, Chulalongkorn University has a unique opportunity not only to evaluate CTPB but also to develop relevent medical education that is in close touch with the community and health system planners.

DISCUSSION

A final report of Task Force II was presented to the biennial meeting of the Network of Community-Oriented Educational Institutions for Health Sciences, in September, 1989. In general, it was agreed that the two main goals of the Task Force had been achieved as follows:

1. 'Analytic tools' have been developed to help health sciences education institutions to identify the major health problems of the region they serve, and to display these problems in a prioritized, scientifically valid and understandable fashion. These tools are the various prioritization schemata developed by the project fellows (one of which is described in Appendix A), and the Priority Health Problems Model (Figure 1), which evolved from the work of the Task Force. [This model is described in more detail in Neufeld V.R., Bearpark S. and Winterton C. (1989) "Optimal outcomes of clinical education", in *Clinical Education and the Doctor of Tomorrow*.. Gastell B. and Rogers D.E., eds. New York: New York Academy of Medicine.]

2. Strategies have been developed for incorporating this analysis of priority health problems into the curricula of medical schools. This report contains descriptions of several institutional examples of this incorporation of regional or national priority health problem analysis into the curriculum. A prime example is the new Community-targetted, problem-based track in the Faculty of medicine at Chulalongkorn University in Thailand.

Two other products of the Task Force are worth mentioning, primarily some general lessons that can be drawn and, second, some further projects that can be attributed fairly directly to its activities.

Lessons

The general lessons can be stated briefly as follows:

1. We, along with many others, became more aware of the importance of usable health information, in terms of its quality, its access and, in particular, its various sources. These sources include not only epidemiological data, but also the analysis of trends and the systematic collection of 'public opinion'. This public opinion of necessity includes the systematically obtained views of various community groups.

2. There is a special need for university-based 'health intelligence units' with a capacity for analyzing current health information and summarizing this information so that it can be used for planning research and education programs, and likely for health service planning as well. See Related Projects below.

3. The Priority Health Problems Model is likely applicable to health professions education beyond simply undergraduate medical education. As an example, Ms. Heather Craig, one of the McMaster University fellows, applied the model to undergraduate nursing education. We are becoming aware of other applications as well, such as post-graduate medical education and the education of physiotherapists.

4. The process exemplified by the Task Force is worthy of note as we believe it contributed to 'institution strengthening', and thus may serve as a model of how to structure an international task force whose work is spread over several years. The key elements of the process included: the careful selection of a small number of institutions, each of which contributed special expertise to the work, and each of which is influential in its own country; the designation of project fellows most of whom were emerging leaders and have subsequently contributed strongly to further education development in

their own institutions, the sequence of three annual study blocks interspaced with time spent back with institutional colleagues; and the use of annual conferences toward the end of study blocks as a strategy for project review and modification.

5. As the work of the Task Force evolved, it became apparent that there could be many fruitful links between the process of community-oriented education and the conduct of health systems research. A variety of research projects evolved from the work of the fellows and their institutions; some of these are now in progress. More fundamentally, we have become convinced that the capacity for systematic research and analysis of community health problems must be one of the key competencies of future physicians and other health professionals.

6. It became apparent as the work of the Task Force progressed that there was a need for a broader focus on institution strengthening that would include: the involvement of more colleagues in population data analysis, and their participation in education planning; more systematic faculty development in population-based education, and in strategies of institutional change; and the identification of other institutional capacities to better prepare the institution for a pro-active role in regional and national health development.

7. Several participating institutions developed activities which focused on defined population groups. These have become a laboratory for mutual learning where community-based research and education programs and projects are based on collaborative partnerships among universities, governments and community leaders.

Related Projects

Several further projects have been lauched as a result of the Task Force, some of which are listed here. Some are direct derivations and others, while less direct, still were clearly related to Task Force activities and participants.

- Electronic Communications Project for the Network of Community-Oriented Educational Institutions for Health Sciences
  This is a field demonstration project, funded by the Pew Memorial Trust, which involved the Task Force II fellows and institutions. This 18–month project began in April, 1989, and was led by Dr. Elizabeth Alger of the University of Medicine and Dentistry of New Jersey.

- Active Community Participation as an Aid to Promote Health at a District Level: The el Tal el Kebir Project
  This project, led by Dr. Esmat Ezzat of the Suez Canal University, is funded by the International Development Research Centre. Its goals are to develop a methodology for participation of the people in health planning, to monitor participant activities and evaluate these against health indicators, and to synthesize what has been learned and translate this into policies for district-based health systems.

- Gadjah Mada /McMaster University Health Information Management Project
  This Canadian International Development Agency- funded project began in early 1990 and is led in Indonesia by Dean Radjiman and Task Force fellow Dr. Rossi Sanusi, and in Canada by Drs. Charles Goldsmith and Richard Pickering. The project is a direct result of the interactions which occurred during the life of the Task Force.

- University Partnerships in Essential Health Research
  This relatively new Network project was conceived at a combined conference in Egypt in May 1989 of Task Force II and Task Force III (Education in Health Care Settings). After approval by the Network's executive committee, a primary development phase began in mid–1989 funded by the IDRC and the Rockefeller Foundation. In many ways this project is the most direct successor of Task Force II.

  The overall goal of this partnership is:

  > . . . to improve the relevance of health professions education by enhancing the ability of graduates to help identify and solve the problems of communities in which they serve. It is to be achieved by having students participate in health research in a systematic way and as an integral part of their training. The framework for this training is a new system of partnerships among universities, governments and communities, the focus of which is a program of essential national health research.

  The project includes several Task Force II institutions. With its emphasis on student and institutional involvement in "essential national health research" (ENHR), the "University Partnerships" is related indirectly to the recent independent international Commission on Health Research for Development.

* * * *

The activities described in this report underscore the commitment of the individuals and institutions who have been involved in Task Force II to the real goal—a strongly-held resolve shared by all of us—to ensure that universities, through their education and research responsibilities, maximize the contributions they make to the improved health and quality of life of the communities they serve.

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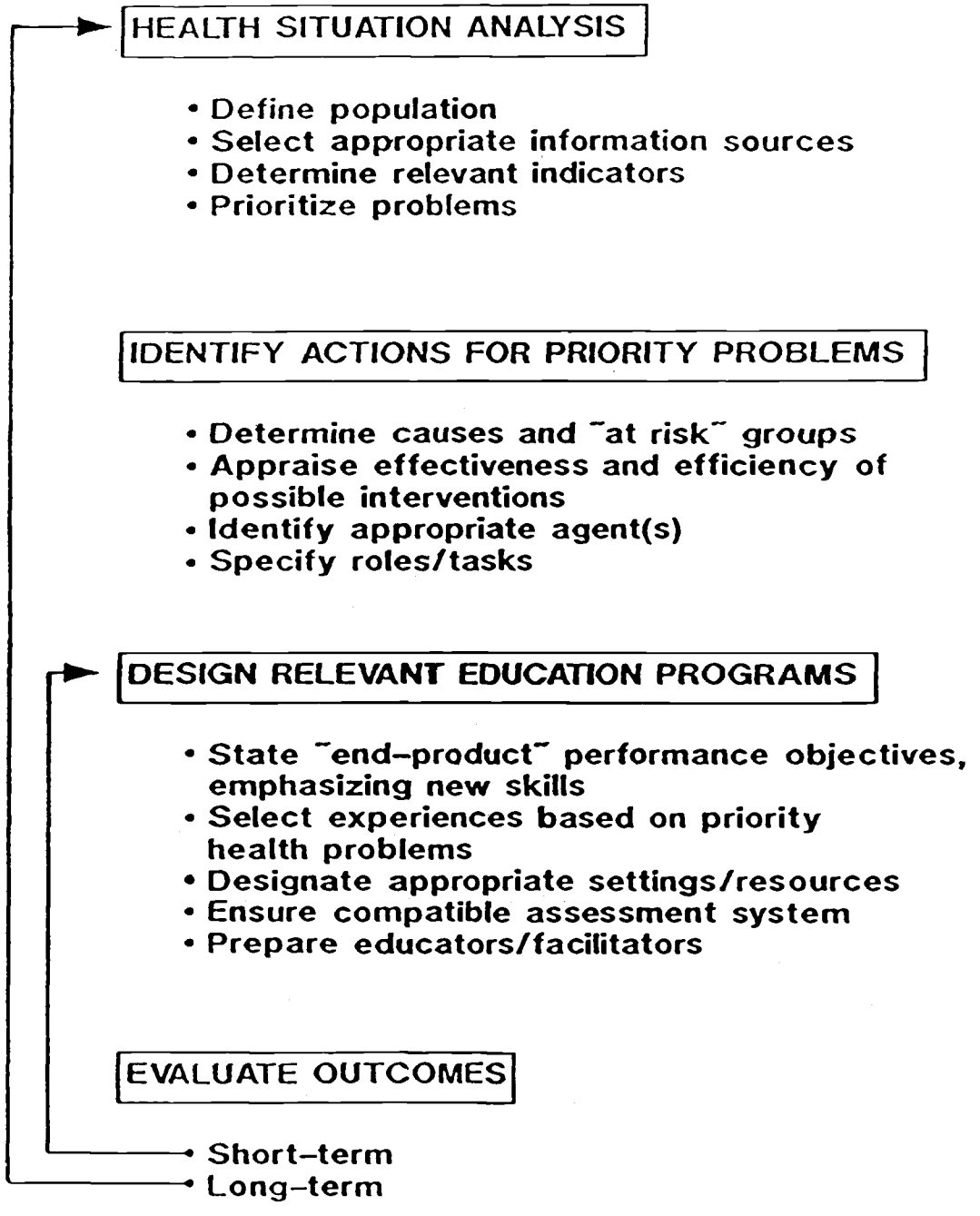
FIGURE 1

PRIORITY HEALTH PROBLEMS MODEL



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Setting educational priorities for learning the concepts of population health

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Summary. Following the World Health Organization's policy of 'Health for All by the Year 2000', doctors are increasingly being seen as health care providers to populations of patients, in addition to their more traditional role as doctors to individuals in a one-to-one encounter. In order for doctors to take on this expanded role, they must learn the knowledge and skills appropriate to population health. In this paper, we propose a method of educational priority-setting which allows educational planners to identify those diseases and adverse health conditions most appropriate for studying the concepts of population health. Using the Measurement Iterative Loop of Tugwell and colleagues as a framework, a table of Priority Illness Conditions was developed and compared with a previous priority list developed from a survey of clinical teachers at the McMaster University Medical School. Discussion of the implications for this approach in setting educational priorities at undergraduate, postgraduate and continuing medical education levels is presented, along with a review of possible shortcomings and caveats in using this approach.

Key words: community medicine/*educ; *curriculum; education, medical; Ontario

Introduction

In the 19th century, major advances in health resulted from an emphasis on the provision of clean water, sanitation, and adequate food supply, as well as the amelioration of overcrowded living conditions. In contrast, 20th century approaches to health and disease have studied the physiological and biochemical basis of disease in depth.

Harper (1986) defines population health as an integration of the environmental and individual approaches to health and disease, and states that the purpose of population health is to improve the health of all individuals. It follows that the goal of medical education is to train doctors who will contribute maximally to the alleviation of the burden of ill health in their communities (Neufeld 1988). Most doctors see and treat patients in a serial fashion, one at a time. Yet populations are composed of individuals, and it is on this population perspective that there is growing worldwide emphasis. Perhaps the best-known statement of this emphasis is the World Health Organization's resolution of 'Health for All by the Year 2000' (WHO 1981).

Medical education in the 20th century has concentrated on providing students with an in-depth understanding of the physicochemical basis of disease, while generally de-emphasizing the population-related aspects of health. Recently, the GPEP report (Project Panel on the General Professional Education of the Physician 1984) called for fundamental changes in the process of medical education. Among these proposed changes was an accentuation of education concerning the health of populations. In particular, Recommendation 4 under 'Purposes

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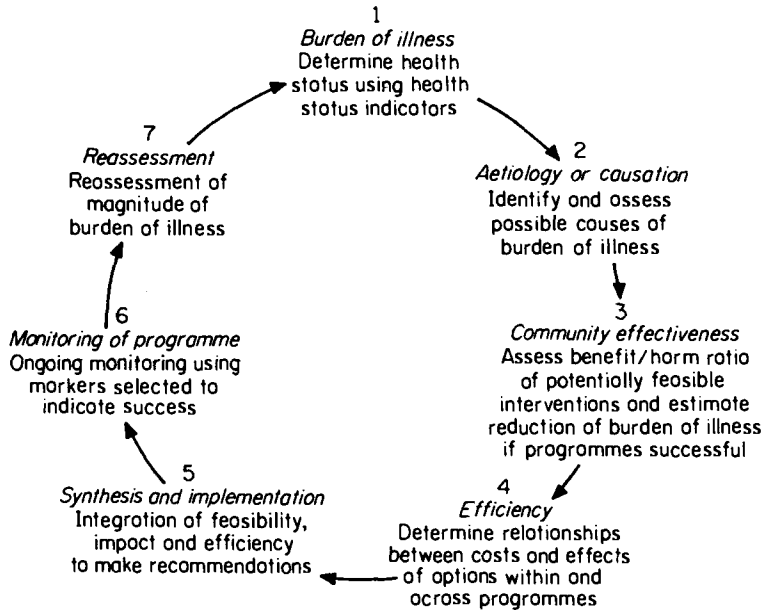

Figure 1. The Measurement Iterative Loop.

of a General Professional Education' states: 'Medical students' general professional education should include an emphasis on the physician's responsibility to work with individual patients and communities to promote health and prevent disease'.

Doctors are trained to treat and prevent diagnosable diseases, while much of the burden of illness in a population is related to non-diagnosable 'ill health' and suboptimal functional status. The taxonomy of diseases, in particular the International Classification of Diseases (ICD), is inadequate to describe in a complete-enough fashion the burden of illness (White 1985).

Tugwell *et al.* (1985) described a conceptual framework, the Measurement Iterative Loop, by which a health problem can be described in broader terms of population health. Originally proposed as 'a framework for the critical appraisal of need, benefits and costs of health interventions', the Measurement Iterative Loop (Fig. 1) may also be used as a basis for the setting of educational priorities and as a tool for understanding the broader, population-based implications of a wide variety of diseases and adverse health conditions. Tugwell *et al.* applied this approach to the problems of hypertension and osteoarthritis in their original paper, while Pickering *et al.* (1987) used the Loop as an educational model for health promotion and the role of the doctor in the problem of smoking cessation.

The doctor's role in health care is indeed changing, particularly that of the primary care doctor. Neufeld *et al.* (1989) have pointed out the roles which a primary care doctor may undertake:

(1) Care provider for individual patients: This is the time-honoured, traditional role of doctors, serving individuals who seek care.

(2) Care provider for a population: This is an extension of the provision of care, not only to those who seek it, but also to those who do not, or cannot seek care, but who are part of a defined health care population. An example might be a family doctor with a 'list' of patients or potential patients; or a primary care doctor responsible for a primary care unit.

(3) Educator: Being available to individuals and groups in the community as an 'expert' consultant in matters of health and illness.

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Further, doctors could be proactive educators, taking the initiative to provide well-communicated, scientifically based health information to the general public, and to special interest groups.

(4) Advocate: Taking responsibility, as an informed and concerned citizen, for a special 'cause' designed to improve the health of the public (for example, being an advocate for seat-belt legislation).

(5) Manager: In some situations, doctors find themselves responsible, not only for their own actions, but also for those of other health workers. This calls for special skills in the facilitation of team-work, in leadership development, in health systems evaluation and resource allocation.

(6) Researcher: Increasingly, doctors can be expected to provide documentation of their work, primarily for the purposes of financial auditing and professional audit/feedback. With the advent of computerized record systems, it is highly likely that practising doctors could contribute quantitative information, not only for the purposes of describing their own practices, but also for the analysis of health patterns and practices in a region.

How can doctors be better trained to serve the health needs of populations, not just individuals? The curriculum of a medical school, almost by definition, outlines those aspects of health and disease which the teaching staff feels are educational priorities. In a problem-based learning environment, the health problems chosen for study define the basis of the curriculum; the way in which problems are studied (e.g. from the perspective of organ systems) defines the curricular emphasis. Given the immense variety of health problems which could be studied, educational planners need a method for choosing which problems to include in a curriculum.

The first step in establishing educational priorities is to determine those factors of a health problem which are indices of its importance. A widely accepted index of importance is the prevalence of the problem in the population under consideration. The University of Ottawa reported its attempts to base its medical curriculum mainly on an index of prevalence (Rosser & Beaulieu 1984). The McMaster Priority Problems and Conditions Survey looked at prevalence, but also considered educational priorities (clinical logic, prototype value, urgency, treatability, and interdisciplinary input) (Chong *et al.* 1984). In the context of quality assurance for health care of the elderly rather than of education, Fink *et al.* (1987) used an expert consensus approach to choose seven conditions from an initial list of 42. Issues of prevalence decided the inclusion of a disease on the initial list, but the final list of seven conditions was chosen by applying indices of (1) significant adverse effects on outcome, (2) beneficial interventions, (3) significant benefit if quality is improved, and (4) the feasibiity of monitoring quality of care.

Methods

Our approach was to use indices similar to those discussed above but to apply them to actual Canadian health data. Our aim was to produce a list of priority health problems for use by curriculum planners at McMaster University. The indices chosen are indicated in Table 1. The rationale for the scoring system criteria is discussed below.

Magnitude of the burden of illness

The magnitude is measured by the incidence or prevalence of the disorder. When both estimates are available and reasonably accurate, the estimate giving the higher score for this criterion is used, to be sure that no priority problems are missed.

The rationale for the incidence figure of '50/100000/year' is as follows: assuming that the average family doctor in Canada cares for approximately 2000 patients, and that an illness condition can be classified as a priority if the doctor encounters it at least once per year, then a frequency of one diagnosis per 2000 patients per year converts to 50/100000/year, and the illness is assigned a magnitude weighting of 2. Decreasing the frequency by one order of magnitude means that the doctor would encounter this diagnosis once every 10 years; averaging this across diagnoses gives an average span of 5 years,

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which converts to 5/100000/year and a magnitude weighting of 1. A weight of 0 is assigned to conditions less frequent than 5/100000/year.

For the prevalence scores, a value of 2 is assigned to a condition affecting 3% or more of the population, based on the assumption that this figure translates to approximately 60 patients affected in an average general practice patient population of 2000 patients. A weight of 1 is assigned to conditions having a prevalence two orders of magnitude below 3% (i.e. 0·03% or less than one patient in an average general practice), and a weight of 0 is assigned to conditions having a prevalence of less than 0·03%.

One-year case-fatality rate

A one-year case-fatality rate (CFR) of 3% is considered to be significant for the Canadian health care system, and is accordingly assigned a weight of 2. A weight of 1 is assigned to a CFR two orders of magnitude less (0·03%), and a weight of 0 to a CFR less than 0·03%.

Level of remaining quality of life

This is the most difficult index to calculate with accuracy, since in most instances data are not available concerning quality of life after an illness begins. Thus, in most cases, the weighting assigned to this criterion will represent the 'best estimate' of the clinicians who provide care for these conditions. In spite of the inaccuracy of this weighting, however, the authors believe that this criterion is important enough to qualify for a separate weighting from the other criteria, since the quality of life issues which have been discussed in the literature in the last several years

Table 1. Scoring system for Priority Illness Conditions

Index	Score	
M	2	Incidence >50/100000 population/year
Magnitude	1	Incidence between 5 and 50/100000/year
	0	Incidence <5/100000/year
OR		
	2	Prevalence >3% of population
	1	Prevalence between 0·03% and 3% of population
	0	Prevalence <0·03% of population
C	2	One-year case-fatality rate >3%
Case-fatality	1	One year case-fatality rate between 0·03% and 3%
	0	One-year case-fatality rate <0·03%
Q	2	Level of remaining quality of life <30%
Quality	1	Level of remaining quality of life between 30% and 70%
	0	Level of remaining quality of life >70%
T	2	Duration of deviation from health >10 days
Time	1	Duration of deviation from health between 3 and 10 days
	0	Duration of deviation from health <3 days
U	2	Delay allowable before the implementation of the intervention
Urgency		<6 hours
	1	Delay allowable before the implementation of the intervention between 6 and 48 hours
	0	Delay allowable before the implementation of the intervention >48 hours
P	2	The preventive measure is both available and applicable
Prevention	1	The preventive measure is available but not applicable
	0	The preventive measure is neither available nor applicable
D	2	The diagnostic process is both accurate and applicable
Diagnosis	1	The diagnostic process is accurate but is not applicable
	0	The diagnostic process is neither accurate nor applicable
R	2	The intervention is both efficacious and applicable
Therapy	1	The intervention is efficacious but is not applicable
	0	The intervention is not efficacious

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(Wilkins & Adams 1983) are of vital importance in understanding the priority of an illness. This index score is based on dividing quality of life into thirds (roughly), with 70% or greater having a weight of 0 (i.e. least important, since intervention makes the least difference here), 30–70% a weight of 1, and less than 30% a weight of 2.

Duration of the deviation from health

A duration of 10 days or more of 'less than good health' is assigned a weight of 2. It may seem that the cut-off point of 10 days is quite short, but when this criterion is combined with a deviation from health (index Q) of 2 (i.e. less than 30%), it may be seen that such conditions would not be tolerated when appropriate diagnosis and treatment are available. A weight of 1 is assigned to durations of 3 to 10 days, since most minor or self-limiting conditions in Canada have this duration, and a weight of 0 is assigned to durations of less than 3 days.

Urgency of the illness condition

When intervention is required within 6 hours to maximize the chance of returning to previous levels of health (e.g. in an acute myocardial infarction), a weight of 2 is assigned. If the intervention may be postponed for up to 48 hours (e.g. otitis media), a weight of 1 is assigned, and if the intervention may be postponed longer than 48 hours (e.g. uncomplicated peptic ulcer), a weight of 0 is given. These weightings reflect the opinion of medical educators that medical education must give emphasis to those urgent situations where intervention is rapidly required and the doctor does not have time to search for information about diagnosis and management in textbooks or journals, but must have this knowledge at his or her fingertips (Chong *et al.* 1984).

Prevention: availability and applicability

The term 'availability' is defined as the existence of a preventive measure (or measures) which is applicable at the community or primary care level and for which published evidence exists for preventing the occurrence or in lessening the severity of the illness. If a measure is available, a score of 1 is assigned. 'Applicability' involves the components of 'community effectiveness' as used in the Measurement Iterative Loop, and considers provider compliance with recommended preventive measures, patient compliance with these measures, the availability of facilities for delivering the intervention (e.g. personnel, equipment, etc.), and an overall measure of the effectiveness of the intervention. When a measure is both available and applicable, a score of 2 is assigned.

Diagnostic process: accuracy and applicability

'Applicability' is defined in a fashion analogous to that above, determining whether providers and patients comply with the diagnostic process and whether personnel and equipment necessary to make the diagnosis are available to all in the community. 'Accuracy' refers to a diagnostic test, which, under the conditions in which it is usually used (i.e. primary, secondary or tertiary care), has a positive predictive value of 90% or greater or a positive likelihood ratio of 6 or greater. Of major importance for the level of positive predictive value is the usual prevalence of the disorder in the community (Sackett *et al.* 1985), so that some diagnostic tests are not useful in primary care settings where the prevalence of most disorders is lower than the prevalences found in the referred populations of secondary and tertiary care settings. A score of 1 is assigned if a diagnostic process is accurate, but not applicable. A score of 2 indicates satisfactory accuracy and applicability of such a process. The score 0 indicates that a given process is neither accurate nor applicable.

Intervention in established cases: efficacy of the intervention

While 'Applicability' has been addressed, 'Efficacy' defines an intervention which has been shown to produce more good than harm for the patients to whom it is applied under ideal circumstances of high patient and provider compliance. Where possible, an efficacious intervention is defined as one which yields an outcome of more than 90% of the premorbid quality

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of health. A score of 0 is assigned to a non-efficacious intervention. An efficacious intervention scores 1; an intervention that is both efficacious and applicable scores 2.

Development of the Priority Illness Conditions (PIC) table

Following the development of the prioritization schema, we tested its validity by comparing it with the list of priority problems generated by the clinical teachers in the PPCQ questionnaire (Chong *et al.* 1984). In order to have information to analyse with the PIC schema, we collected data from a variety of sources:

(1) Eight local general/family practice groups, with a combined patient population of over 56000 patients, provided one year's worth of patient encounter data in the form of diagnoses made by the doctors and other health care providers; four of these groups were teaching practices of the McMaster University Department of Family Medicine.

(2) Four local teaching hospitals contributed one year's worth of data on hospital separations (i.e. discharge diagnoses).

(3) Provincial and national survey and institutional data were obtained from publications provided by the Ontario Ministry of Health, the Canada Health Survey, and Statistics Canada.

(4) For the purposes of this study, the 'community of interest' was taken to be the Regional Municipality of Hamilton-Wentworth, and the most recent census data were obtained so that rates of specific conditions could be extrapolated.

One of the major difficulties in incorporating these data into the PIC prioritization scheme was the lack of standardization of coding systems, making comparisons between sites and levels of care hazardous. For example, the hospital data were either in the form of ICD-9 codes or the Ontario Broad Code format (a subset of ICD-9). The data from community family practices were in the form of ICHPPC codes, another subset of ICD-9 more appropriate to primary care. Thus, some editing of the data to fit the needs of the PIC schema as well as the educational needs of medical students was necessary. The result of the application of the priority-setting method to the raw data obtained was the Priority Illness Conditions table (PIC table), a portion of which is reproduced in Table 2.

The priority health problem (PHP) weighting score for each condition is simply a summation of the other scores. The table is divided into three sections: index M, the magnitude; indices C (case-fatality rate), Q (quality of life) and T (duration of the condition) which may collectively be called the 'severity' of the condition; and indices U (urgency), P (preventability), D (diagnosability) and R (treatability), which may collectively be called the 'effectiveness of intervention' scores. Thus, conditions are separated into priority and non-priority categories. The following arbitrary decisions were made to facilitate this process.

All conditions with a magnitude score of 2 were called 'common', and as such were designated as high 'priority'. The rationale for this was that all undergraduate medical students, regardless of their eventual specialization, needed to be aware of the magnitude, severity and effectiveness of intervention for such conditions. Conditions with a magnitude score of 1 were analysed further. To be designated a priority problem, an uncommon problem had to achieve either a severity score equal to one-half the full score for this section (i.e. 3 out of 6) or an effectiveness score equal to one-half the full score for this section (i.e. 4 out of 8). In effect, the condition, though uncommon, becomes a priority by virtue either of its severity in those affected or of the effectiveness with which health professionals may intervene. For example, pertussis becomes an educational priority by virtue of its magnitude (1 out of 2) and its severity (3 out of 6) and its effectiveness of intervention (4 out of 8); by contrast, infectious mononucleosis, with a magnitude of 1, has a severity score of 2 and an effectiveness score of 0, which gives it the status of a non-priority problem from an educational viewpoint. Finally, 'rare' conditions (those with a magnitude score of 0) had to meet the half-marks rule for both severity and effectiveness to be considered a priority problem. For example, typhoid has a severity score of 4 out of 6 and an effectiveness score of 7 out of 8, making it a priority; porphyria, although severe (5 out of 6), has a low effectiveness score (0 out of 8), making it a non-priority problem.

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Table 2. Priority Illness Conditions for medical education

Illness conditions	Priority Health Problem Indices M	C	Q	T	U	P	D	R	Severity score C+Q+T	Effectiveness score U+P+D+R	Priority Health Problem weighting
Priority problems											
Common problems											
Cardiac arrhythmias	2	2	1	2	2	1	2	2	5	7	14
Ischaemic heart disease	2	2	1	2	2	1	2	2	5	7	14
Burns	2	1	1	1	2	2	2	2	3	8	13
Asthma	2	1	1	2	2	1	2	2	4	7	13
Alcohol abuse	2	2	1	2	1	2	2	1	5	6	13
Malignant neoplasm (skin)	2	2	1	2	2	1	2	1	5	6	13
Malignant neoplasm	2	2	2	2	1	1	2	1	6	5	13
Sexually transmitted diseases	2	0	0	2	2	2	2	2	2	8	12
Thrombophlebitis	2	1	1	1	1	2	2	2	3	7	12
Valvular heart disease	2	1	1	2	1	2	2	1	4	6	12
Seizure disorder	2	1	1	2	2	0	2	2	4	6	12
Congestive heart failure	2	2	1	2	1	0	2	2	5	5	12
COPD	2	2	1	2	0	2	2	1	5	5	12
Fractures/Dislocations	2	0	0	2	2	1	2	2	2	7	11
Helminth/Pediculosis	2	0	0	2	1	2	2	2	2	7	11
Prenatal care	2	1	0	2	0	2	2	2	3	6	11
Abdominal pain NYD	2	0	0	2	1	0	1	1	2	3	7
Menopausal syndrome	2	0	1	2	0	0	1	1	3	2	7
Anxiety	2	0	1	2	0	0	1	1	3	2	7
Acne/Seborrhoea	2	0	0	2	0	0	2	0	2	2	6
Irritable colon	2	0	1	2	0	0	0	1	3	1	6
Myalgia/Arthralgia NYD	2	0	0	1	0	0	0	2	1	2	5
Acute URI	2	0	0	1	0	0	2	0	1	2	5
Chronic rhinitis	2	0	0	2	0	0	0	1	2	1	5
Uncommon problems											
Schizophrenia	1	2	2	2	2	0	2	1	6	5	12
Glaucoma	1	0	2	2	2	0	2	2	4	6	11
Viral hepatitis	1	1	1	2	1	2	2	1	4	6	11
Encephalitis	1	2	2	2	2	0	1	1	6	4	11
Tuberculosis	1	1	0	2	0	2	2	2	3	6	10
Affective psychosis	1	2	1	2	1	0	1	2	5	4	10
Deficiency anaemias	1	0	0	2	0	2	2	2	2	6	9
Chronic skin ulcer	1	0	1	2	0	2	2	1	3	5	9
Pertussis	1	1	0	2	1	2	1	0	3	4	8
Infertility	1	0	1	2	0	1	2	0	3	3	7
Hypertrophy of tonsils	1	0	0	2	0	0	2	2	2	4	7
Scoliosis	1	0	1	2	0	0	2	1	3	3	7
Rare problems											
Malaria	0	1	1	2	2	2	2	2	4	8	12
Typhoid	0	2	0	2	2	1	2	2	4	7	11
Meningitis	0	2	2	2	2	0	1	2	6	5	11
Non-priority problems											
Reye's syndrome	0	2	2	1	2	0	1	0	5	3	8
AIDS	0	2	2	2	0	1	1	0	6	2	8
Diverticulosis	1	0	0	2	0	0	2	1	2	3	6
Thalassaemia	0	2	1	2	0	0	1	0	5	1	6
Ganglion	1	0	0	2	0	0	0	2	2	2	5
Porphyria	0	1	2	2	0	0	0	0	5	0	5
Infectious mononucleosis	1	0	0	2	0	0	0	0	2	0	3

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Following the division of the PIC table conditions into priority and non-priority categories, comparison with the teacher survey of 1984 (Chong *et al.* 1984) revealed substantial agreement between the two lists. Common, severe problems for which effective interventions exist, such as ischaemic heart disease, burns, and asthma, were clearly high priorities when assessed either by a method dependent on analysis of health data or by a consensus of clinical teachers. Similarly, conditions of lower prevalence and severity, for which interventions are of limited or questionable value, were considered to be of low educational priority by both approaches. Of greatest interest were those conditions which the teachers felt were priorities but which did not appear in the PIC table; among these were spontaneous abortion, premenstrual syndrome and osteoporosis. Also of interest are health problems and conditions which one might believe should be educational priorities but which appear neither in the PIC table nor in the teacher survey; such conditions might include deficient nutrition of the elderly, smoking, and immobilization following accidents or surgery. Possible reasons for these discrepancies will be discussed in the following paragraphs.

Discussion

The approach to priority setting in medical education described in this paper can be a method for stimulating students to internalize broad approaches to thinking about each patient's individual clinical problem in population and societal perspectives, in addition to learning basic mechanisms/pathophysiology. In particular, the concepts embodied in the Measurement Iterative Loop are useful for the analysis of health problems in a broader context, whether for curriculum development, for planning the allocation of research resources, or in health policy planning. The questions which educational planners at each medical school must answer are: 'To what extent should students at this medical school be aware of concepts of population health? How can medical students best learn the knowledge and skills of a population-based approach to medical education? If a population-based approach is a priority, how and where can we fit the requirements for this educational approach into our already overcrowded curriculum?'

There are a number of ways in which educational priorities can be set. The first is the method of fiat, whereby one or a small number of powerful academic staff members hold absolute control over what is taught in the curriculum. This outmoded method of curriculum development has virtually disappeared.

The second method is that of 'expert' consensus; this is the method of the curriculum committee. The problem with this method in setting educational priorities for population health is that few members of the usual curriculum committee know enough about issues of population health. To gain a broader perspective about these issues, particularly the unmet health needs in a population, a curriculum committee should include health services researchers (Fink *et al.* 1987).

A third method of priority setting may be accomplished by survey. It is possible to survey educators concerning their beliefs about educational priorities, and then use these results to influence the curriculum. This approach was taken at McMaster University in 1984 when the Priority Problems and Conditions questionnaire was sent to all teachers who taught clinical clerks. The teachers were asked to rate a number of health problems with which they would normally be concerned in their specialties on six scales:

(1) Prevalence — the degree to which the problem or condition is common in patient care settings.

(2) Clinical Logic — the degree to which the problem has important value for clinical problem-solving.

(3) Prototype Value — the degree to which the problem or condition, although rare, is an excellent model for study.

(4) Urgency — the degree to which immediate intervention is required at the time of presentation.

(5) Treatability — the degree to which there is sound evidence that an intervention, either preventive, therapeutic, or rehabilitative, does more good than harm.

(6) Interdisciplinary Input — the degree to which the condition may be suitable for promoting the study of concepts from a range of disciplines.

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Primary Care (ICPC), which includes a Reason for Encounter classification, incorporates methods for defining such an episode of care. In the future the ICPC may form a better underpinning for health care data from the primary care level (White 1985).

Frequently, medical students are unfamiliar with searching for population-specific health data, and it may be of value in the introduction of population health concepts to make available to the students a collection of national, state/provincial and local health data, a guide to health needs assessment (Chambers *et al.* 1983), and population statistics such as local census data in a small reference library. This could avoid student complaints of inordinate amounts of time spent tracking down the data needed for an understanding of population health. Also of use would be reports of the distribution of diagnoses and health problems in previously published studies (e.g. the Canada Health Survey (Statistics Canada 1987) and the National Ambulatory Medical Care Surveys in the USA (Hoermann 1973; Gagnon *et al.* 1982)).

It is likely that for students to embrace and understand fully the kind of critical thinking involved in population health and Iterative Loop concepts, a major degree of reinforcement must come from the postgraduate students, and from full-time and part-time teachers who act as mentors and role models to the students. Many of these mentors may be completely unfamiliar with the concepts, let alone have had any experience applying them. Teaching staff committed to the introduction of population health concepts into the curriculum must explore educational programmes and incentives for medical teachers to learn and become comfortable with the concepts of population health, and to pass on to their students an enthusiasm and respect for these issues that are encountered in day-to-day patient care, as well as in tutorials and lectures.

This report has focused on the teaching of population health to medical undergraduates. The concept may be extended to other levels of medical education, including postgraduate training and continuing medical education (CME). Indeed, positive outcomes for this type of training would become visible and measurable sooner when applied to more advanced levels of medical education. Alger and colleagues have used the concepts of population health at the CME level to design an educational programme in cancer prevention for primary care doctors in New Jersey (Alger, personal communication, 1987).

Clearly, the schema outlined in Table 1 for judging the educational importance of an illness or condition represents an ideal towards which to strive, rather than a *fait accompli*. In developed countries at least, data on incidence, prevalence and case-fatality rate are generally available and of reasonable quality. However, data on quality of life following an illness, the accuracy and predictive value of diagnostic tests under varying circumstances, the efficacy of various preventive, therapeutic and rehabilitative measures, and other indices of the priority of an illness are currently being investigated and debated. This need not preclude using the health data we have in priority setting; however, it must remind us to be cautious in evaluating the outcome of such a prioritization exercise, and to continue to search for more and better data to feed into the priority-setting equation.

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Primary Care (ICPC), which includes a Reason for Encounter classification, incorporates methods for defining such an episode of care. In the future the ICPC may form a better underpinning for health care data from the primary care level (White 1985).

Frequently, medical students are unfamiliar with searching for population-specific health data, and it may be of value in the introduction of population health concepts to make available to the students a collection of national, state/provincial and local health data, a guide to health needs assessment (Chambers *et al.* 1983), and population statistics such as local census data in a small reference library. This could avoid student complaints of inordinate amounts of time spent tracking down the data needed for an understanding of population health. Also of use would be reports of the distribution of diagnoses and health problems in previously published studies (e.g. the Canada Health Survey (Statistics Canada 1987) and the National Ambulatory Medical Care Surveys in the USA (Hoermann 1973; Gagnon *et al.* 1982)).

It is likely that for students to embrace and understand fully the kind of critical thinking involved in population health and Iterative Loop concepts, a major degree of reinforcement must come from the postgraduate students, and from full-time and part-time teachers who act as mentors and role models to the students. Many of these mentors may be completely unfamiliar with the concepts, let alone have had any experience applying them. Teaching staff committed to the introduction of population health concepts into the curriculum must explore educational programmes and incentives for medical teachers to learn and become comfortable with the concepts of population health, and to pass on to their students an enthusiasm and respect for these issues that are encountered in day-to-day patient care, as well as in tutorials and lectures.

This report has focused on the teaching of population health to medical undergraduates. The concept may be extended to other levels of medical education, including postgraduate training and continuing medical education (CME). Indeed, positive outcomes for this type of training would become visible and measurable sooner when applied to more advanced levels of medical education. Alger and colleagues have used the concepts of population health at the CME level to design an educational programme in cancer prevention for primary care doctors in New Jersey (Alger, personal communication, 1987).

Clearly, the schema outlined in Table 1 for judging the educational importance of an illness or condition represents an ideal towards which to strive, rather than a *fait accompli*. In developed countries at least, data on incidence, prevalence and case-fatality rate are generally available and of reasonable quality. However, data on quality of life following an illness, the accuracy and predictive value of diagnostic tests under varying circumstances, the efficacy of various preventive, therapeutic and rehabilitative measures, and other indices of the priority of an illness are currently being investigated and debated. This need not preclude using the health data we have in priority setting; however, it must remind us to be cautious in evaluating the outcome of such a prioritization exercise, and to continue to search for more and better data to feed into the priority-setting equation.

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