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Medical Education: Meeting the Challenge of Implementing Primary Health Care in Sub-Saharan Africa

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KEYWORDS

• Medical education • Primary health care • Sub-Saharan Africa

The ideas expressed in this discourse have been derived from the experience of planning for undergraduate medical education at the Aga Khan University (AKU) Medical College, Nairobi, which is a private university for the East African region; broad-based general education and the principles of liberal arts are incorporated in the curriculum.

Medical education in sub-Saharan Africa (SSA) must be defined by its health needs and the health care services required. This article begins by describing the sociodemographic milieu that determines the disease pattern. Then it considers the compelling case for primary health care (PHC) in the context of community participation and multisector development as the driver of a medical education plan. An attempt is made to define the attributes of a doctor required to be effective in the region and to anticipate the inevitable challenges that lie ahead, including authorization and implementation of the plan as well as productive retention of graduates in the region, their professional development, and their contributions to the efficiency of health care. The potential roles of the AKU and the wider Aga Khan Development Network (AKDN) in East Africa are discussed in this regard.

THE HEALTH CONTEXT

The population in SSA is largely rural. Access to health care is difficult in the absence of good roads and transport. Rural people are mostly subsistence farmers,

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pastoralists, and fisherman, whose livelihood depends on natural resources. A high dependence on the climate for food security without adequate capacity to adapt to climate change has consequences for nutrition and health.¹ As the fastest growing region of the world (annual growth rate 2.4%) the population of SSA, currently at 840 million, is expected to double in just 30 years.² Half the population is younger than 18 years²; as it grows older the incidence of chronic disease will increase. Urbanization is gaining momentum, and by 2050 it is expected that 67% of the population in SSA, 1 billion people, will reside in towns and cities.³ In urban areas there are unplanned settlements of migrant populations, such as Kibera in Nairobi where nearly 0.5 million people live in unhygienic conditions. Moreover, urbanization exposes inhabitants to unhealthy lifestyles that predispose to chronic disease. Desperate economic situations lead to increased crime and violence, with its attendant consequences for health and social harmony. More than 40% of people in SSA are extremely poor, earning less than US\$1 a day, and 30% moderately so, earning between US\$1 and US\$2.⁴ For various reasons it seems that the intended halving of extreme poverty by 2015 will not be achieved and that poverty in one form or another will continue to be a major determinant of ill health. Poverty leads not only to material deprivation and lack of access to basic services but also disempowerment due to lack of autonomy and freedom of expression.⁵ The predilection of women in their reproductive years to human immunodeficiency virus (HIV)-AIDS in SSA exemplifies the consequences of these conditions. By inference from indicators of good health in relatively poor countries like Sri Lanka, Mechanic⁶ suggests that education, empowerment of women, and the provision of basic health services have independent roles in determining health status. From a population health perspective, the impact of poverty on early child development is particularly distressing; adversities during intra-uterine life and early childhood are biologically embedded and lead to cognitive impairment, behavioral disorders, developmental delay, and health impairments in later life.^{7,8} Of course, poor health itself predisposes to social deprivation; hence, alleviation of poverty is dependent on addressing the health-related Millennium Development Goals (MDGs).

As a consequence of the interplay between social, demographic, and environmental factors, communicable and noncommunicable diseases (NCD) coexist in SSA.⁹ NCD and effectively controlled HIV-AIDS comprise an increasing burden of chronic disease¹⁰ requiring not only long-term health care but concurrently the maintenance of useful lives through employment, such that the economic welfare of the family and normal child development are assured. A PHC approach could be adopted to keep patients with chronic disease out of hospital for as long as they remain stable.

Maternal and neonatal mortality rates continue to be unacceptably high in SSA.¹¹ Although mortality in children younger than 5 years has improved worldwide, in SSA the decline in deaths, especially from malaria, has been less impressive.⁹ PHC is well placed for the management of the bulk of problems related to maternal, neonatal, and child health (MNCH). Because PHC is situated in communities, it can be strengthened also to manage and refer other prevalent problems such as nutritional disorders, trauma, and mental illness, which require multidisciplinary or multisectoral interventions at district level.

THE CASE FOR PRIMARY HEALTH CARE

Having identified MNCH issues and chronic diseases as major health problems, and social and demographic factors including inequity in the distribution of health services as root causes, a logical approach to improving the health of the population might

include: universal and equitable access to health care including health promotion, disease prevention, curative care, and rehabilitation; a comprehensive approach integrating PHC with community participation and multisector development; a reliance on trained community health workers (CHW) to deliver elements of health care to families and the community; accessible center-based health care for management of unstable clinical states; efficient systems for provision of drugs and equipment, health information, supervision, and training; and the selective referral of patients for specialist care.¹² In this regard, the district is the smallest organizational entity with managerial responsibility and some financial authority to improve the health of the population (100,000–500,000 in SSA districts) within a defined geographic area. The district is supported by national health strategies and policies.¹³

On the 30th anniversary of the Alma Ata declaration, its advocacy for PHC as a means of meeting the health-related MDGs was renewed. The experience of the last 30 years has shown a decline in the mortality rate in children younger than 5 years in 30 low-income and middle-income countries worldwide, with Thailand in the forefront, who have made progress with PHC and identified the following factors linked to success: national commitment; health systems integration; devolution to the district level; use of CHWs; and removal of financial barriers to an essential health package.¹⁴

Although success so far may be limited, emerging concepts in PHC make its prospects for the twenty-first century promising. Such factors include: technological innovations, for example, the use of mobile phones for tele-health; improved access as a result of trained health workers permeating homes, work places, and schools; innovative financial schemes for health; incentive-based human resource management; multisector development encompassing education, agriculture, infrastructure, and income generation; research-based evidence for best practices; the rights revolution with people demanding equity, high quality, and respect from health providers as well as protection from health hazards; and active engagement of the population in their health care as coproducers of health and as a source of funding.¹⁵

THE DOCTORS' ROLE IN SUPPORTING PHC

While acknowledging that PHC's success is dependent on teamwork, it is important to question the role of doctors. Failure to attract doctors has led to nonphysicians filling the void in many African district health services. As a rule, nonphysicians have lower secondary school achievements and receive only 3 to 4 years of clinical training of variable standard.¹⁶ Although they may have useful roles, at present only the public is the arbiter of their performance. Their advantage is that they are more easily retained at lower pay in underserved communities to which many belong.¹⁶ Although equipped for pattern recognition and simple algorithmic intervention, their basic knowledge of structure, function, and mechanisms of disease is insufficient to understand and rationally manage less familiar clinical presentations. It is clear that one of the doctor's roles should be to define and contribute to the professional training of other health care personnel. In addition, the doctor in the team must assess the needs and support for health care, appraise the effectiveness of the service, and search scientifically for evidence to aid understanding and management of diseases prevalent in the community, in collaboration with professionals who have the requisite expertise. When medical officers without a specialist qualification in family medicine are posted to district health services, they must perform better than nondoctor surrogates; however, without appropriate postgraduate education and training even they are not prepared for full utilization of their potential abilities. Family physicians especially trained for PHC, who can recognize and manage a range of diseases and are prepared to

investigate their underlying root causes in the community, are the obvious first choice. Family medicine training has been going on in South Africa for 15 years and is presently accepted as an area of specialization, as it is also in Kenya and Rwanda.¹⁷

Shortage and maldistribution of doctors overall is, however, a major problem. There are on average 13 doctors per 100,000 people in SSA, compared with 164 in the United Kingdom and 274 in the United States, and they are mostly based in the cities.¹⁸ The design of a PHC system clearly must optimize the engagement of doctors, who comprise the most expensive element in the system. Nonphysicians ostensibly can be trained to recognize and manage common clinical problems or follow a plan of management of more complex illness defined by the physician after one consultation, provided the physician receives feedback from the nondoctor attendant and is available for referral if something either unanticipated or unusual occurs. In Mexico, the doctor's role has been successfully optimized by using mobile phone technology to coordinate care.¹⁹

MEDICAL EDUCATION

Based on the preceding discussion, the practicing medical doctor in SSA should have acquired the attributes given here.

An Understanding of the Importance of the Social Determinants of Health and Illness

Chantler²⁰ wrote:

The main task for a doctor is diagnosis. Working out what is wrong and why it is wrong requires knowledge of biomedical and behavioral science and an understanding of people and the society in which they live. The purpose of education at university and medical school is to ensure this is achieved, and to provide a sound foundation for continued learning throughout a professional career.

While this stated purpose of medical education may be self evident, in reality it is not the prevailing model of medical practice. Most medical practice is centered round the diagnosis of an illness and its immediate causative or risk factors. For example, doctors are not usually concerned about why individuals in an endemic zone for malaria are not protected against mosquito bites, or what determines the lifestyle and diets of patients with coronary artery disease. To remedy this problem, the objectives of medical education must be widened to include consideration of factors influencing human development through various stages of life, from a fetus to an adult, that also influence health. The factors include maternal education, nutrition and health before conception, normal gestation, safe birth and survival of mother and child, nutrition and nurturing, the social environment of the infant and child, access to competent health care, education from pre-primary to secondary school, technical and higher education, conditions of work, family beliefs and behavior, the influence of teachers, peers, and role models, as well as a host of other social, cultural, political, economic, and environmental conditions. Some of these factors may affect gene expression and consequently influence learning ability, health, and behavior of the individual and collectively the society, which in turn creates unfavorable conditions for early child development.²¹ A sustainable, coordinated effort by multiple sectors of government, with civil society and communities, is necessary to improve human development indices and population health.

An Understanding of the Bio-Psychosocial Model of Care and Health Systems

In Africa, most doctors gravitate to large public or private hospitals in the cities and often deal with once controllable disease, now advanced with multiple comorbidities

and complications. The prevalent model of hospital care ignores the origin of disease and factors conditioning its progression, such as geographic, financial, social, and cultural limitations of access to health care, compliance with treatment, ability to cope with illness, and continuity of care. Two conclusions emerge from this disconnection: (1) doctors need to understand the greater benefits of the bio-psychosocial model of health care, and (2) should contribute to developing a system of health care delivery that could avoid or ameliorate many of the clinical problems they deal with. The objectives of such a system should be to promote health, prevent disease, provide timely intervention, and refer patients selectively to higher levels of care, with concern for cost effectiveness.

On graduation and after completing a period of mandatory internship during which the doctor assumes direct responsibility for patients and works under close supervision, he or she should have the ability and the opportunity to develop further as a clinical specialist, a generalist, a population health practitioner, a scientist, or a manager. This pluripotency is an asset for an integrated pyramidal health care delivery system that is committed to the holistic concept of primary health care, and its provision for appropriate referral of complex problems.

Clinical Competence

Clinical competence of a high order distinguishes an effective medical doctor from other health professionals. The authors use the term clinical competence in a composite sense to include: (a) the basic skills of clinical observation, investigation, and reasoned diagnosis and management of illness based on knowledge concepts emanating from biologic and biomedical sciences; (b) empathy, a caring attitude, and ethical professional behavior; (c) practical skills of communication with patients and relatives, performing commonly required procedures, and managing emergencies; (d) interpersonal skills of communication and collaboration.

Effective communication with culturally diverse and socially disadvantaged people deserves special mention. The considerable cultural heterogeneity among Africans requires an understanding of how different beliefs and practices influence illness, and how differences across cultures influence attitudes to illness: for example, understanding who makes the decisions in the family, the role of women in decision making, belief in the notion that illness is due to fate, the importance given to spiritual and other forms of healing and religious taboos, and the ideations that exist about death and dying. The doctor should be able to exercise a nonjudgmental approach to community-specific norms of behavior, such as "bride price," which prevents women in certain African cultures from giving informed consent for interventional procedures,²² and social stigmas attached to illness such as HIV infection. Evidence indicates that the ability of health services to deal effectively with diverse cultural and social conditions reduces inequity in health care and improves health outcomes.²³

A major source of inefficiency and ineffectiveness of PHC is poor management of resources.²⁴ Health personnel need to be trained and motivated continually to do good work together as a team. Doctors trained as family physicians are well placed to provide training and supervision for health care and to appraise health workers' performance, as well as being well positioned to direct the cost-effective use of resources through coordination of evidence-based care.

CHALLENGES FOR EDUCATION

A significant factor to consider is that in SSA, entrants to medical college are 17- to 18-year-old high school leavers. Selection is highly competitive and based on

academic achievement, placing potential candidates from underprivileged communities at a disadvantage. Evidence from South Africa indicates that students from rural areas are more likely to work after graduation in underserved areas.²⁵ Diversity of students' geographic, cultural, and socioeconomic backgrounds could also facilitate communication with patients, communities, and health services. However, ensuring a diverse student body is not easy. It will require enhancement of school education in underprivileged areas, assessment of students' competence to study medicine in English, and consideration of attributes besides academic achievement, as well as students' attitude toward social service and tolerance of diverse cultures. If promising candidates need improvement in English language proficiency, due to lack of opportunity, facilities to prepare them for higher education will be necessary. Financial subsidies will be required for students from economically underprivileged families for 6 years of education.

Expanding students' knowledge horizon to include understanding of human development and values of responsible citizenship requires broad-based general education. A 4-year North American style of liberal arts education could not be adopted as practiced; it requires time that competes with the opportunity cost of contributing to health care and earning a living, on the one hand, and adds significantly to the cost of education on the other. Nevertheless, the concept of acquiring broad-based knowledge, skills of reasoning, self-directed learning, problem solving, teamwork, communication, reflection on one's experience and beliefs, as well as tolerance of diversity of thought and culture is germane to the practice of medicine. Just how such a foundation can be provided and seamlessly melded into professional education without extending the period of study beyond 6 years requires imaginative curriculum planning, careful consideration of essential knowledge for professional practice in the context of the health service for which undergraduates are being prepared, and instructional strategies that enable efficient learning of concepts. A strong foundation of biomedical and population health sciences, as discussed earlier, is essential for solving clinical problems. Thoughtful faculty with experience in education and health sciences will be required; such individuals will be engaged in active, relevant research. This approach means that the medical school must provide appropriate support for laboratory-based and community-based research. These resources will also support graduate programs that should prepare the next generation of faculty.

Clinical and community-based experiences should begin early, preferably in the context of integrated PHC. Family medicine could provide the foundation for experience in PHC. It is essential for at least part of the experience to be gained in conditions of health care that are widely prevalent in SSA. For a private medical school this requires partnership with the public sector; sadly there are no relevant examples of public-private partnership to learn from. There are other problems too: facilities for training in family medicine are few at undergraduate and postgraduate levels, role models are scarce, and livelihood as a primary care physician in the community is threatened by competition from specialist clinicians on the one hand and nonphysician clinical officers and pharmacists on the other.

Selecting 17- and 18-year-olds to study medicine is a serious responsibility that should anticipate a "change of mind." Provisions should be made for alternative careers, otherwise attrition will ensue and intellectual talent will be wasted. A natural point of transition occurs after 4 years of study, before concentration on clinical science begins. At this juncture it would be appropriate to award a BA in Health Sciences. Students who do not wish to pursue clinical medicine and those wishing to digress for a spell of research could follow new paths creditably.

Finally, clinical competence should be gauged by aligning teaching-learning strategies and educational assessment to professional outcomes and making provision for experiential learning. The competence is finally put to test during the internship year, when the graduates have direct responsibility for patient care under supervision. Continuous monitoring of graduates in practice will be necessary to judge whether the curricular objectives are attained.

RECRUITMENT AND RETENTION OF MEDICAL GRADUATES IN THE HEALTH SERVICES OF SSA

Assuming that medical education is successful, will the health service engage the graduates productively? Significant gaps exist in integration of PHC with community participation and multisector development, as well as in referral systems to higher levels of health care. The functions of health services are affected by deficient governance, management, funding, training of personnel, equipment and medical supplies, information systems, and operational research to inform policy and planning. Without opportunities to contribute to change, graduates working in PHC services may not continue for long, especially if they are not able to sustain themselves financially when they have a family of their own to feed, clothe, and educate. Graduates from poor communities may continue in service for a longer period; however, they will be disillusioned if their effort is not supported adequately by government. Persistence of unsatisfactory conditions of work and limited opportunities for professional development will encourage migration of doctors, and insufficiency of professionals will be a recurrent problem.

THE POTENTIAL ROLE OF AKU AND AKDN

The AKDN is a group of private, international, nondenominational agencies in specific regions of the developing world with a wide range of mandates, for example, health, education, and rural development. The AKDN promotes private sector enterprise working closely with communities and governments to respond to cultural, economic, and social challenges on an ongoing basis. AKU is a component of AKDN.

AKU started with a Faculty of Health Sciences in Pakistan 25 years ago. It now has an international presence, with diverse programs in several countries. In East Africa it offers advanced nursing studies (ANS), postgraduate medical education (PGME), and graduate programs in educational development. It is being developed to become a comprehensive university for the region, with a Faculty of Arts and Sciences (FAS) in Arusha, Tanzania and a Faculty of Health Sciences (FHS) in Nairobi, Kenya, with a Medical College and a School of Nursing and Midwifery. The concurrent development of FAS and FHS provides significant opportunities. Students entering the University will receive broad-based general education during their first 2 years, irrespective of whether they intend to pursue studies in medicine, nursing, or a degree program in the social sciences, arts, humanities, natural sciences, or mathematics. In medicine, the university already provides PGME and plans to offer graduate studies leading to Master's degrees and PhDs. Doctors will be educated and trained to become family physicians, clinical generalists, specialists or subspecialists, population health practitioners, or biomedical scientists. Finally, under the overarching theme of social and economic determinants of health, there is likely to be significant interdisciplinary research collaboration between FHS, FAS, and other international programs of the university.

In East Africa an integrated AKDN health care system is being planned that will incorporate the AKDN health services in the region and involve partnerships with

service providers in the public and nongovernmental organization sectors. Partnership at the level of the district health services in the public sector is likely to be particularly rewarding, as it involves raising the standard of care in that sector. In the Coast Province of Kenya the Aga Khan Foundation has been promoting early childhood development and preschool education, water and sanitation programs, agricultural yield, and income generation. The Community Health Department of the Aga Khan Health Service, working with the government, has developed a Health Management Information System and is training health workers at the community and facilities levels, as well as providing courses of study in health systems management. In addition the ANS program has been upgrading the knowledge and skills of nurses who are in service in the public and private sectors. AKU's training programs in family medicine, nursing, and midwifery, and its research programs centered round the social and economic determinants of health could potentially provide the much-needed impetus for developing an integrated PHC model in collaboration with other AKDN agencies, the government, and international universities interested in global health. This approach could form a model of health care supported by appropriate education and training that might encourage retention of doctors and stimulate integration of social services for health care in other parts of SSA.

SUMMARY

Basic considerations of a conceptual plan for undergraduate medical education at the AKU Medical College, Nairobi, designed for graduates to function effectively in PHC in the public sector, are presented.

The plan responds to the adverse social, economic, environmental, and demographic factors that will continue to play a major part in determining the disease burden in SSA and the suitability of PHC to address health problems emanating from this situation. The crucial role of doctors specially trained in family medicine to support PHC is emphasized. Their roles could be optimized if they trained other health personnel to manage routine problems and follow instructions for continuity of care of more complex problems, asking for review of their work in an appropriate and timely manner. A doctor's clinical competence underpinned by sound scientific concepts and supported by principles of management is highly desirable for establishing functional links with the community and government sectors involved in human and community development.

However, the functions and sustainability of PHC require significant planning and development in partnership with government. Of crucial importance are requirements for development of faculty, education and training of health service personnel including those involved in health service management, research to support education and service, and development and sustenance of an effective health service.

It is proposed that AKU has the necessary potential in terms of the breadth and depth of its educational programs, its research focus on the social determinants of health, its immersion in communities and partnership with government as part of the wider AKDN, and its collaborative relationship with international organizations interested in global health to develop a model of medical education for the East African region that is supportive of primary health care.

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