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Original Research

The challenges of public health education with a particular reference to China

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ARTICLE INFO

Article history:

Received 23 September 2009

Received in revised form

20 November 2009

Accepted 15 February 2010

Available online 25 March 2010

Keywords:

Public health

Public health education

China

SUMMARY

A recent seminar on public health education at the Chinese University of Hong Kong posed some key questions for the future of public health, as well as how the next generation of public health specialists should be educated. This paper summarizes some of the discussions on the future of public health education in China within the context of China's healthcare reforms and trends in global public health education.

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The urgency of public health

Public health is becoming increasingly topical. The growing burden of non-communicable chronic diseases, threats of new emerging infections, demographic shifts and global environmental concerns underline the importance of population approaches that take account of a broad view of health. The emergence of human swine flu in Mexico and the USA, and the subsequent worldwide pandemic reinforce the importance of the lessons of severe acute respiratory syndrome (SARS) for strong public health systems. The need for capacity in the public health workforce is not only for disease control and health protection, but also to ensure that

health systems deliver effective health care. Conversely, discussion of the role of primary health care in ensuring better public health is gaining greater prominence. The challenges of modern epidemics cannot only be addressed through doctor–patient interactions, and consideration of socio-economic factors is increasingly recognized as key to effective practice.

For many in public health, the 1978 Alma-Ata declaration and its iterations which stress the development of primary care and social and economic measures to promote health for all have set the context of their practice.¹ For some, the balance since Alma-Ata has tilted towards personal health care at the expense of population health.² However, current concerns about the affordability and inequity of health care,

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doi:10.1016/j.puhe.2010.02.009

the ever-expanding menu of newer drugs and procedures, and ageing of the population are near universal. This is reflected in increasing demand, rising costs, and a return towards curative and hospital care, making re-exploration of the Alma-Ata principles both timely and relevant.³ A better alignment of a population-based public health approach with personal health services is needed urgently, along with better integration of personal health care and public health. To quote van Weel et al., primary care needs to be organized on the principle of care for individuals in the context of the population, and the future of primary care, and health care in general, will depend on how effectively a community-oriented approach and its contribution to equity and social cohesion is achieved.²

The recognition that health systems play a key role in public health has been endorsed by the World Health Organization (WHO) in the report 'Primary Health Care – Now More Than Ever', published on the 30th anniversary of the international conference of Alma-Ata. Arguing the need to revisit Alma-Ata, the report identifies four broad policy directions of improving health for all: tackling health inequalities through universal coverage; putting people at the centre of care; integrating health into broader public policy; and providing inclusive leadership for health.⁴ This approach requires public health strategies as well as clinical skills in meeting the needs of populations, particularly the poor and vulnerable, and is congruent with the influential report from the Commission on Social Determinants of Health which stresses the relevance of an ecological approach to health, essential to achieving the millennium development goals.⁵ The implicit need for stronger public health was again re-inforced by the 2009 WHO World Health Assembly resolution which calls for primary healthcare services to provide health promotion and disease prevention as well as curative care and palliative care, and for integration and co-ordinated practice to take account of the needs of populations and to promote active participation by all people.⁶

The corollary to these global health policy developments is an increasing interest in appropriate educational strategies, and a growing recognition that public health education must change if it is to meet the needs of modern societies, the health threats they face and the challenge of developing equitable health systems.

China and other surrounding countries face similar challenges to many high-income countries which have already seen escalating levels of chronic disease. Whereas the traditional concern of public health, particularly within Asia, was with controlling communicable disease, the present challenges also include the burden of the epidemic of non-communicable disease and achieving health for all with the limited resources available. Protecting and promoting health amongst a growing elderly population, as well as maintaining efforts to reduce the burden of disease related to infections such as tuberculosis and human immunodeficiency virus/acquired immunodeficiency syndrome, requires a well-prepared workforce. The increasing emphasis on health literacy, social marketing and community empowerment further highlights the need for new skills and training. Such an analysis therefore raises the key question: How should we educate for better public health practice and who should we educate?

What is public health?

Although more attention is being given to public health, there is still a lack of consensus on what is meant by 'public health'. Discussions on public health education without a consensus about what is meant by 'public health' are bound to become directionless. Early in the last century, when public health was in its early phase of development, it was defined as the science and art of preventing disease, prolonging life and promoting health and efficiency.^{7,8} Epidemiological approaches dominated.

More recently, the Institute of Medicine has defined public health as 'What we as a society do collectively to assure the conditions in which people can be healthy'.⁹ 'The conditions in which people can be healthy' underscores the broad scope of public health and legitimizes its interest in natural, social, economic, political and medical care factors that affect health and illness. The impact of the 2008 earthquake in Sichuan, China on people's health, and the importance of the public health response in both the immediate and long-term aftermath are vivid examples. Furthermore, conditions for health, such as systems, structures and policies, apply to all and equally, but the response of the public health system will need to be tailored to the particular situational factors of different cultural environments.

The nature of collectivity distinguishes public health from clinical medicine in two important ways. Public health uses collective or population methods and concerns about the health of the entire population, whereas clinical interventions are targeted at individuals and for the health of the individual. As the population consists of individuals, the two approaches are inevitably inter-related. Collective interventions such as policies will eventually affect individuals and often also need individual participation, whereas interventions for individuals add up to the totality of the society's effort although they could also directly affect the population, such as in the control of infectious diseases. Historically, public health concepts and practice originate from the prevention of communicable diseases, either at an individual level or population level, and have been included in public health practice. Prevention is thus usually considered a part of public health. However, prevention of chronic diseases such as treating hypertension for prevention of stroke and coronary heart disease is normally viewed as clinical medicine. In addition, in many countries, traditional public health methods targeted at individuals, such as vaccination and child and maternal care, have been successfully relocated into the clinical sector, most often primary care or general practice. Such individual public health approaches to prevention are too important to be neglected.

Although, in essence an individual approach, primary care is where much of clinical medicine and many public health practices meet, and recognition of this interface is extremely important for building a seamless framework for improving the health of the population. Clinicians, particularly those in primary health care, are key deliverers of many public health interventions. Their synergy thus needs to consider the implications for strategies for public health education.

Some of the core features of public health have been summarized succinctly by Koplan et al., writing about global

health stress the roots of public health as distinct from clinical medicine, and re-emphasize the four basic factors underlying public health: decision-making that has traditionally been more evidence based, had a focus on populations rather than individuals, with a goal of social justice and equity, and an emphasis on prevention rather than curative care.¹⁰

Thus, as part of the response to the emphasis on collective methods and the health of the entire population, public health must take a population perspective and focus on prevention. It must also be concerned with the poor and vulnerable, place emphasis on health as a public good, and recognize the importance of systems and structures (Table 1).¹⁰ To achieve its missions, public health requires a multidisciplinary approach which includes working with clinicians, particularly those in primary care, as well as with other disciplines and sectors.

Questions for public health education in the new context

Four fundamental questions arise from this analysis:

- Whether current public health education is appropriate;
- Whether the balance of skills and competencies is appropriate for meeting the public health challenges we face;
- Who might be included in any strategy to educate the public health workforce; and
- How to fill the capacity gaps.

This leads on to further fundamental questions about the roles of universities, particularly schools of public health and medical schools, in training, and whether and how more multidisciplinary career pathways should be developed. A formal response to all these questions will not be attempted in this paper as the discussions are, as yet, incomplete.

However, for China, these questions have a particular relevance since the healthcare reform agenda has highlighted not only the need for more investment in public health, but also in the public health system and capacity.¹¹ The latest iteration of the direction for healthcare reform in mainland China has stressed the importance of the public health system as one of the four essential elements of a basic universal healthcare system. Educating the public health workforce must, de facto, be part of the reforms to achieve the goal of strengthening the establishment of the public health service system by building up sound public health networks of disease prevention, health

education, maternal and child health care, mental health, first aid, blood collection and supply, health supervision, and family planning. In addition, the public health functions of the medical services system based on a basic medical services network need to be improved. Such systems need to be supported by an information-sharing and resources-sharing public health services system, enhanced by sufficient capacity in the public health service to respond to public health emergencies and to decrease the urban–rural inequity in utilization of public health services.

As well as the need for public health perspectives in provision of health care, there is an expectation that health sectors, institutions, schools, communities and companies will conduct health education, advocate healthy lifestyles, and disseminate health knowledge and information through the media to increase the level of health awareness and the self-care ability of people. Thus, the new healthcare reform needs a strengthened the public health function, supported by a reformed public health education system and by public health specialists trained in modern theory and practice.

Review of public health education in China

Although the symposium representatives came from a variety of Asian countries, the discussion focused on China and the challenge of responding appropriately to the new emerging agendas. The need for a national educational policy to synthesize with global developments to achieve locally appropriate practice was agreed, as was the need to integrate public health with clinical and primary care approaches to deliver public health services. However, is the public health system ready for such change? Is the current public health education appropriate?

The public health system and its education system in mainland China remains largely based on the Soviet model adopted since the 1950s. Today, the core business of public health falls into disease prevention and control, public health emergency response, epidemic reporting and management of health-related information, surveillance of and intervention against health hazards, laboratory testing and evaluation, health education and health promotion, technical management, and applied research guidance. Undergraduate education in public health, which takes place in medical schools, covers areas including epidemiology, biostatistics, environmental health, occupational health and safety, food hygiene,

Table 1 – Comparison of the broad and narrow definitions of public health for China.

	New broad definition (ecological approach)	Traditional narrow definition (prevention approach)
Missions	Collective efforts for conditions in which people can be healthy	Focused on (in particular infectious) diseases prevention and control
Theoretical basis	Social and health sciences	Biology and behavioural sciences
Focus	Health system, management and policy, environmental influences, health equality	Risk factors of disease
Underlying disciplines	Multidisciplinary approach, evidence sharing	Epidemiology
Major strategies	Making public policies	Designing prevention measures, either high-risk approach or population approach
Benefits	Long-term, fundamental health benefits	Reduction in disease prevalence and relevant health problems

school health, health toxicology and radiation protection. In recent years, medical sociology, maternal and child health, health management and policies, health economics, health inspections and their roles within healthcare services have been gradually added to the curriculum of most schools. There has also been an increase in masters courses in public health. Currently, most graduates in public health work in centres for disease prevention and control at various levels, and some work in health inspection institutions which have functions of inspecting and managing goods and services related to health.

From discussions at the workshop, 10 significant problems facing public health education in China were identified:

- Goals for public health education and training at the national level have not been clearly defined;
- Public health education is not seen as independent of the traditional medical education system, and the unique characteristics of public health education are not recognized and respected;
- In schools of public health, there is a lack of expertise in health economics, health management, health policy, and health-related law and regulations;
- It is difficult to attract high-quality students to public health as compared with clinical medicine;
- The importance of public health education as part of the public health system has not been well recognized by the Government;
- Curriculum development has not kept up with the modern developments in public health;
- Teaching has not kept up with the new technology and teaching contents;
- Structure of teaching faculty has not kept up with the requirements of education reform;
- Teaching materials have not kept up with the rapid growth of scientific evidence and with the change in health needs; and
- Links across universities (e.g. with social science faculties) are poor.

In addition, there is lack of co-operation between academic institutions and health providers in training public health students. Too often, the education provided does not take account of the needs in the field. One solution which could be developed is enhanced co-operation between schools of public health and health providers, such as centres for disease control and protection. They could collaborate to develop new ways of working, such as public health case teaching and field training. Health professionals from centres for disease control and protection could also play a more important role in teaching courses, particularly the practical aspects. There are great opportunities for joint research to address current important health problems of the community. What is needed is a mechanism to co-ordinate trainers from universities and healthcare institutions to enable achievement of educational and training aims. Field practice of students also needs to be improved; for example, by adjusting the length of practical experience, engaging school teachers and health professionals to help supervise practice, and selecting appropriate topics for practical experience for future careers.

Another problem is co-operation within universities. Multi-disciplinary education and training needs good co-operation between schools of public health and other schools or faculties such as medicine, nursing, sociology, management, law and economics. The current situation in China is usually that public health schools use their own educators/trainers without good arrangements to use other sources. This not only has an adverse effect on the quality of teaching, but also restricts curriculum development in meeting the needs of students.

This analysis suggests that the right balance of skills and competencies to meet the public health challenges do not yet exist, and that there is an obvious need for a review and revitalization of public health education to promote:

- Leadership of the entire health system;
- Collaborative actions across all sectors;
- Multidisciplinary approaches to all determinants of health;
- Political engagement in development of public health policy; and
- Partnership with the populations served.

At the end of their training, future public health graduates in China need to have developed a professional consciousness, have knowledge and skills in the basic medical sciences, have gained an understanding of population health as well as an understanding of the principles of management and social mobilization, be competent in information management, and understand how to undertake scientific research. They also need to understand their roles in relation to the delivery of community-based services. The present analyses of the challenges facing public health education in China are supplemented by previous studies, most of which are written in Chinese.^{12–16}

Broadened public health workforce and responses in education

If these are China's public health needs, who should be considered for training within the public health workforce? This question is one faced by many countries. The issue of who to include within educational strategies for public health is complicated. In general, the public health workforce in mainland China is considered to be primarily those working in centres for disease control and protection, many of whom are trained within the existing system and are medical doctors. However, the challenges of the healthcare reforms require a broader definition of public health which is in line with the ecological model for determinants of health, as well as being responsive to the increasing focus on patient-centred care. Whilst there have been some examples of education for this new public health in other countries which go some way to provide educational frameworks, no system has managed to address all aspects of the new agenda. In addition, all public health structures need to be constructed locally even if common goals are shared.

International experiments

Public health capacity gaps exist in all health systems, and resources are needed to address problems such as high rates

of tobacco smoking, growing inequalities between rural and urban areas, increasing accidents and injuries both at work and on the road, environmental pollution and food security. Public health emergencies such as SARS, H1N1, earthquakes and disasters require multidisciplinary responses.

The Association of Schools of Public Health has provided a good picture of the multidisciplinary opportunities available in the USA, highlighting the diverse and dynamic field of practice which includes a range of future careers such as health services management, health education, environmental health, nutrition, international health, programme management and biomedical laboratory work.¹⁷ Educational models in the USA include undergraduate and postgraduate degrees, as well as opportunities for lifelong learning. The UK professional framework for public health education is multidisciplinary and includes support for specialists through government-funded training programmes. The workforce model¹⁸ recognizes three levels of practice:

- Specialists;
- Those whose work involves some public health; and
- Those with a general interest in public health.

This model assumes the need for both specialist training and for training of different levels of competence across a wide variety of groups in the workforce. Appropriate training and status for multidisciplinary public health workers as well as for those who are medically/clinically trained public health professionals who are not specialists is structured using a defined set of tiered competencies and standards, and is tailored to other sectors including industry, business, education, media, transport and others.¹⁹

Postgraduate specialist training

In Hong Kong, the professional public health community follows the pre-reformed model of training in the UK and uses the specialist examinations of the UK Faculty of Public Health as a benchmark. Public health training in the UK is based on a government-funded specialist training programme, and all those in specialist training are expected to acquire core competencies²⁰ over 5 years. Hong Kong has a less structured but similar approach to specialist training (i.e. 5-year postgraduate training) which is competency based. However, in Hong Kong, public health specialists are medically trained, having qualified as physicians through a training programme common to all doctors. In the UK, where public health is also a postgraduate specialty, there are parallel pathways for clinicians and non-clinical (multidisciplinary) specialists. In the USA, where there is more reliance on schools of public health, and Masters of Public Health degrees and public health qualifications are multidisciplinary, new systems of assessing professional competence are being introduced.²¹

The role of undergraduate non-medical public health

In many countries, the multidisciplinary nature of public health is well recognized; in others, such as the UK, there is a marked shift away from the medical model with explicit recognition of the multidisciplinary basis of specialist public

health training and practice. Such recognition highlights the need to continue to develop public health education within medical schools and clinical training, offering opportunities for all undergraduates to acquire basic knowledge of the key concepts in public health, while at the same time ensuring educational and career opportunities for the many different professions with a public health contribution to make, such as teachers, journalists, researchers, administrators, politicians, entrepreneurs, environmentalists, demographers, sociologists, laboratory scientists and legal specialists. Equivalent specialist multidisciplinary public health training makes it possible for all groups to make a contribution.

However, education is not just for healthcare professionals, be they specialists or interested clinicians. Keeping the public healthy requires not only a well-educated public health workforce but also much better educated citizens. The Institute of Medicine has recommended that all university undergraduates should have access to education in public health, and that public health education should be introduced in high schools. The report²² sets out basic competencies and curricula. This trend to a broader liberal education is being followed in Hong Kong, where the university curriculum is being extended to 4 years along the lines of the US and mainland Chinese model. Not only has a new BSc now been introduced at university level,²³ but public health has been added into the curriculum for high school students as part of liberal studies for all students, and a further module on health and social care management is also being taught in years 4–6 in middle school.²⁴ In the USA, there is a growing demand for public health undergraduate courses, and the Association of Schools of Public Health is in the process of devising undergraduate public health competencies. The Asia-Pacific Academic Consortium of Public Health is working to improve public health through the delivery of education, research and public health programmes by member institutions, and actively supports increasing undergraduate public health opportunities, stressing that public health education is more urgent for its region than the rest of the world and that a better system needs to be built, based on developments and experiments already occurring in other universities and other countries and regions.²⁵

Further debate

Change is needed in public health education in China as elsewhere. In the international context of revisiting Alma-Ata, rethinking the relationship between the technical population-based skills of public health and the delivery of public health programmes within communities and the need to reform health systems needs further discussion and action. At the time of writing, the workshop report was due to be debated at a planned event in December 2009, but it is suggested that some key themes for public health education in China which need further elaboration includes the following.

- Revising all aspects of undergraduate and postgraduate education: this includes revising what medical students are taught and how their curricula can include more public health education.

- Changing the style and contents of teaching: by adopting problem-based learning, by continuous updating of the contents that are appropriate to society's needs, and by providing support through good textbooks and other teaching materials and media.
- Differentiating educational levels and expectations: educational strategies need to take account of specialist [graduate] education, undergraduate education, generalist education including clinical students, and postgraduate education. General education does not need to be as formal as degrees and should include diploma and certificate training, short courses and on-the-job training, as well as considering how to provide education and information to the public.
- Better workforce planning is needed to respond to the needs of communities.
- Training of different talents according to the different regional needs should be considered.
- Engaging and informing the public in the discussion about the need for a strong public health workforce is essential, as is political commitment.

Conclusion

This paper has laid out some of the challenges facing public health education in China, and reflects discussions among those who will help to shape the future of public health education. The challenges are not unique but they are on a large scale. The authors look forward to continued discussion and development as the healthcare reform process in China and elsewhere takes shape, and new systems to promote population health emerge.

Acknowledgements

The authors acknowledge all those who participated in the CUHK Symposium on Future Education for Public Health and contributed to the discussions in this paper, including: Sophia Chan, Department of Nursing Studies, The University of Hong Kong; Wai Man Chan, Department of Health, Hong Kong; Kun Chen, School of Public Health, Zhejiang University, China; Jin-quan Cheng, Shenzhen Centre for Disease Control, China; Tung-liang Chiang, College of Public Health, National Taiwan University, Taiwan; Hong Fung, Prince of Wales Hospital, Hong Kong; SP Mak, Hong Kong College of Community Medicine, Hong Kong; Zong-fu Mao, School of Public Health, Wuhan University, China; Brian Oldenburg, School of Public Health and Preventive Medicine, Monash University, Australia; Mala Rao, Indian Institute of Public Health, Hyderabad; Jia-Ji Wang, School of Public Health, Guangzhou Medical University; Pei-yu Wang, School of Public Health, Peking University, China; Yu Wang, School of Public Health, Lanzhou University, China; Bambang Wispriyono, Faculty of Public Health, University of Indonesia, Indonesia; Ke-di Yang, Tongji School of Public Health, Huazhong University of Sciences and Technology, China; Ya-qin Yu, School of Public Health, Jilin University, China; Zhao-kang Yuan, School of Public Health, Nanchang

University, China; Dan Zhang, Shenzhen Municipal Bureau of Health, China; Zhi-yong Zhang, School of Public Health of Guang Xi Medical University, China.

Ethical approval

None sought.

Funding

1. The K C Wong Education Foundation
2. Chung Chi College, The Chinese University of Hong Kong
3. United College, The Chinese University of Hong Kong

Competing interests

None declared.

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