

From Tropical Medicine to Global Health?

Equity in health for all, but needs differ

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Introduction

The concept of global health was introduced in the beginning of the 21st century to describe the interrelationship of health issues of all people, including those living in low- and middle-income countries (LMICs), classically the domain of tropical medicine and tropical hygiene. It encompasses all preventive as well as curative aspects of health care and aims at equity for all. Does this mean that Tropical Medicine as a discipline is best abandoned and that a geographical focus is no longer appropriate? How does this affect health care in LMICs?

Colonial medicine

Patrick Manson (1844-1922) is generally considered the father of tropical medicine. He lived during the era of colonial expansion of Great Britain, which also occurred in France, Germany, Belgium and the Netherlands. At the time, tropical medicine took shape as a discipline dealing with diseases that were common in hot climates overseas, that were related to poverty, and that were often caused by parasites transmitted by vectors from an animal reservoir. As civil servants and the military were affected by these exotic and unknown conditions in the colonies and after returning home, Manson emphasized the need of special training and research. At the same time, others identified the need for prevention and hygiene (tropical hygiene). (1)

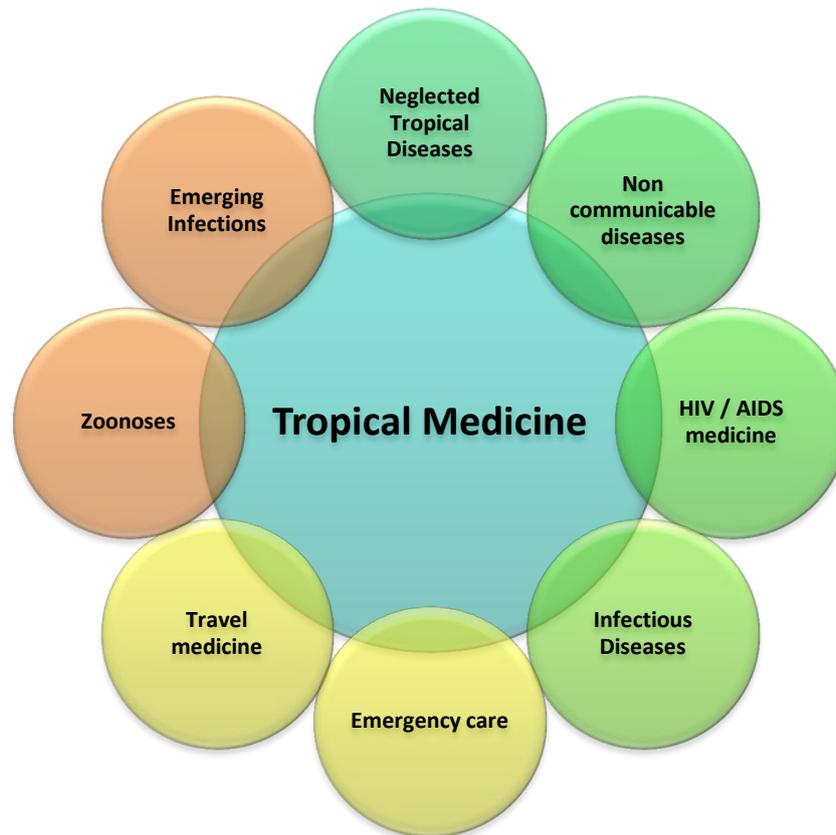
In 1997, when colonial times were well behind us, a motion to abandon tropical medicine as a formal discipline was rejected during a debate among members of the Royal Society of Tropical Medicine and Hygiene in the UK. Those opposed argued that the field of tropical medicine had expanded and had become more diverse and now included infectious diseases and non-communicable diseases, all of which affect populations in the tropics as well as expatriates. (2)

From colonial medicine to medicine in the (sub)tropics

Starting in the 1980s, health care in many parts of the (sub)tropics became dominated by the HIV/AIDS epidemic, and limited resources remained available for the classical tropical diseases. The practice of care was even referred to as the medicine of immunosuppression. (3) An epidemic of tuberculosis followed in the wake of HIV/AIDS. Malaria remained important as optimism on achieving control through DDT spraying appeared not justified. It was not until 1997 that Neglected Tropical Diseases, which had been the core of tropical medicine during the time of Manson, were recognized by policymakers and donors and placed higher on the research agenda. Thereafter, emerging infectious diseases, emergency medicine (disasters, conflict), travel medicine, migrant health, and

non-communicable diseases were defined or given more attention (Figure 1). (4) This broadening of the field of tropical medicine is also reflected in Manson's *Tropical Medicine*, the most authoritative textbook in the field. While the first edition in 1889 was about diseases of 'warm climates', the latest (23th) edition from 2014 covers a wide scope of infectious diseases and also includes prevention, economics, ethics and non- communicable diseases. (5)

Figure 1. Broadening and deepening of Tropical Medicine *anno* 2017 (adapted from ref. 4)



From tropical hygiene to global health

With the end of colonial times, emphasis was increasingly placed on the health care of all people living in LMICs. Tropical hygiene became increasingly important, in particular with regard to prevention. This included improved sanitation to prevent diarrhoeal disease, better housing, and the application of insecticides and bed nets to prevent contact with insects (leishmaniasis, Chagas' disease). Mass chemotherapy was used to treat and prevent onchocerciasis, lymphatic filariasis, and schistosomiasis. Intensive case detection has led to virtual eradication of dracunculiasis (Guinea worm), and improved vaccines and vaccine delivery have made eradication of smallpox possible, with poliomyelitis and measles likely to follow.

In addition to poverty, a failing public health infrastructure (responsible for the outbreak of Ebola), poor governance, and antibiotic resistance remain important challenges. (6) New factors include global warming, which contributes to the spread of vectors such as *Aedes aegypti* to new areas, resulting in the spread of Zika, Dengue, and West Nile and Chikungunya viruses. New outbreaks of

zoonoses (Lyme disease, bird flu) have occurred, and increased international travel has led to major concern about the spread of MERS-CoV [Middle East Respiratory Syndrome Corona virus] and Ebola.

Tropical hygiene has been gradually developing. It still encompasses prevention and control as a central theme, but with a wider focus and increasing attention for global distribution, travel, zoonoses, international relations, environmental factors, and human rights. In 1964, the World Medical Association defined the ethical principles for medical research, including human subjects, in the Declaration of Helsinki, which has guided the conduct of research in the tropics. (7)

Public health and community health developed from tropical hygiene and usually concern the health of people in a certain area or region, with an emphasis on prevention and equity. It is not to be confused with Primary Health Care (PHC) (Table 1). Later, international health described the bilateral relationship between a HIC (High Income Country) and a LMIC.

Table 1. Description of various terms used in health care

Term	Description
Tropical medicine (classical)	Classically included exotic parasitic diseases transmitted by vectors from an animal reservoir Associated with poverty and warm climates Primarily concerned with military and civil servants
Tropical medicine (modern)	Medicine in the (sub)tropics Includes all conditions relevant to a region or country: infectious and non-communicable diseases, according to local epidemiology Emphasis on curative medicine Multidisciplinary Synergy with public health
Tropical hygiene	Established at same time as tropical medicine Concerned with prevention and control of tropical diseases
Public health or community health	Public health includes ‘all organized measures (whether public or private) to prevent disease, promote health and prolong life among the population as a whole’ Community health tends to focus on geographical areas rather than people with shared characteristics Multidisciplinary
International health	Aims at promoting health in another nation (LMICs) Often in a bilateral relationship with a high-income country (HIC) Prevention as well as clinical care Not necessarily multidisciplinary
Global health	Has developed from Public Health and International Health Aims at health equity for all Addresses transnational health issues in holistic approach Multidisciplinary: also includes other sciences such as economics, law, history, technical sciences and biomedical and environmental sciences; includes political or economic factors. Interdisciplinary: also includes curative medicine and rehabilitation, but in a less central role. Addresses not only infections or the eradication thereof, but also all factors that influence health including nutrition (malnutrition as well as obesity), accidents, health worker migration (brain drain), urbanisation, use of tobacco etc.
Primary health care (PHC) (8)	Defined as the key to ‘Health for all’ in the declaration of Alma Ata PHC addresses the main health issues in a community including preventive, curative and rehabilitative services, and addresses, among other issues, immunisation, sanitation, nutrition, family planning and appropriate treatment.
‘One Health Initiative’ (9)	Integrates human medicine, veterinary medicine and environmental sciences, as these are interconnected. Addresses zoonoses and antibiotic resistance induced by use of antibiotics in animal husbandry.

'Global health' has developed from public health and international health. Over the years, several definitions have been used by different institutions (universities, donors, governments) to define their area of interest or to describe how it evolved from public health and international health or was driven by idealism, with equity in health for all as the general theme. (10,11) The rapid spread of pathogens such as bird flu and Ebola as well as antibiotic resistance and obesity has contributed considerably to the evolution of the concept.

The relationship of these various disciplines and LMICs is shown in Figure 2.

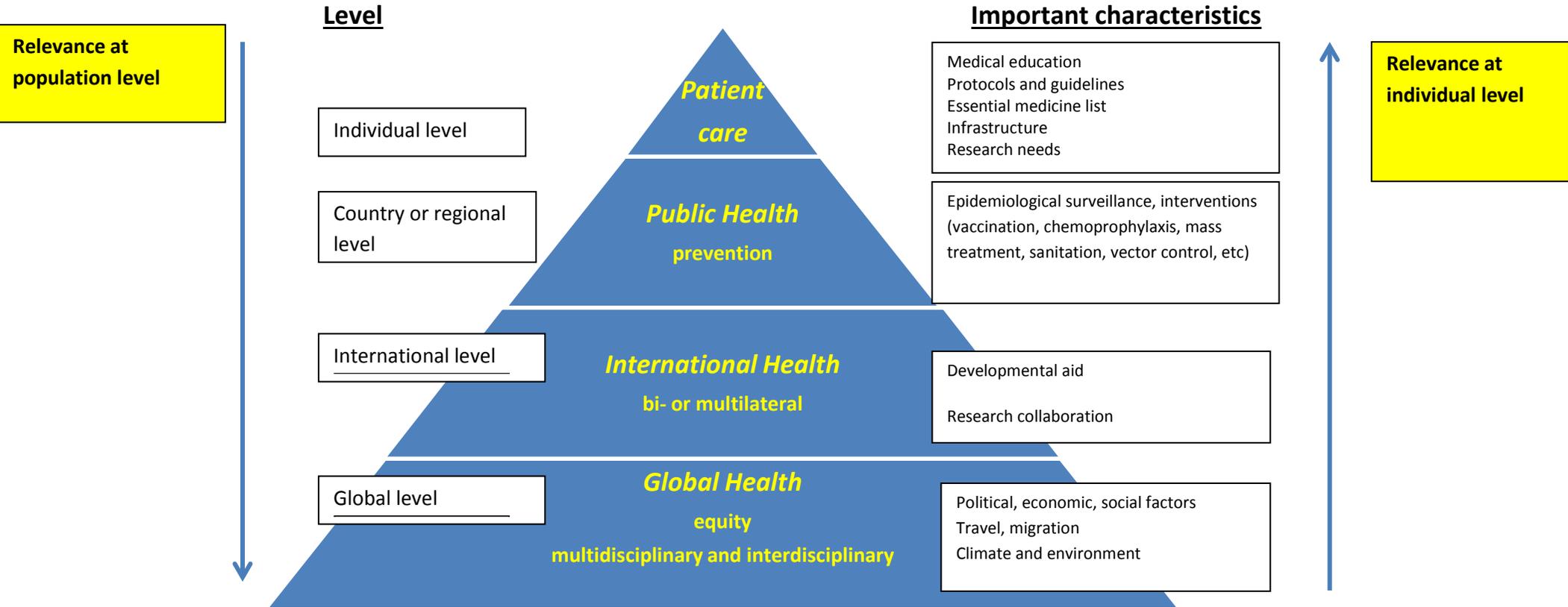
How are the medical needs of LMICs covered in global health?

Global health takes the overall global view and focuses on public health issues. The concept typically comes from the 'North' (HICs) while the needs from the 'South' (LMICs) are different, with poor standards of clinical care and lack of disease control as the central themes. These needs, which are typically covered by the disciplines of tropical medicine and hygiene, do not feature in global health. This lack of focus could have adverse effects for LMICs (Table 2).

Table 2. Health priorities in LMICs

- Clinical care
 - need to be defined in each region for primary health care and hospital-based care
 - human resources
 - infrastructure
- Medical education
 - undergraduate
 - focus on clinical and public health teaching relevant for that region
 - principles of global health included in curriculum
 - doctors need excellent clinical skills and knowledge of how to practise medicine with poor support services
 - trained locally preferably with elective in HIC
 - postgraduate
 - strengthening of South-South collaboration
 - should include exposure in HIC
- Research priorities
 - epidemiological surveys to assess burden of disease and interventions
 - surveillance of diagnoses and antimicrobial resistance
 - point-of-care diagnostic tests
 - effective, safe and affordable treatments

Figure 2. A schematic representation of patient care, public health, international health and global health and characteristics thereof, in relation to relevance at individual and population level, in an LMIC setting



Conclusion

Global health did not develop from tropical medicine nor has it replaced it, but the two disciplines are complementary. This distinction is not merely a semantic one. The expertise, training, focus and commitment acquired by those working in tropical medicine (in synergy with public health) are the best guarantee that addressing the health needs of LMICs remains the highest priority.

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