

## Global Health and Global Diseases

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**Abstract**

*Global health is a field of medicine that deals with studies, research and activities whose priority is to improve health and achieve equality of health for all people of the world. Global health can be said to represent a system that aims to improve world health, reduce inequality and protect against global threats that neglect national borders.*

**Keywords:** Health, Diseases, Vaccine

**Introduction**

Global health is a broad topic with many dimensions and definitions [1]. In order to provide a comprehensive text in all the domains of global health, thousands of pages would be required. Yet in attempting to provide a concise background on the topic, it is important to acknowledge and explore briefly each element that contributes to what is commonly referred to as global health, discuss currently accepted definitions of global health and then synthesize a working definition of global child health that can provide a frame for this text's action oriented guide to global health.

Winslow in 1920 referred to the term of public health as "the science and art of preventing disease, prolonging life and promoting human health through organized efforts and informed choices of society, organizations, public and private, communities and individuals" [2].

In the years hence, public health, its scope and practice has expanded dramatically. However, synthesizing Winslow's formulation of public health with other definitions from the World Health Organization show that public health commonly focuses on prevention of disease, the prolongation of life and the way society organize itself towards these goals. Specifically, public health then concerns itself with disease causes, vectors, transmission, epidemiology and the social and political forces that cause disease to flourish.

The first step in addressing a health problem is to describe its impact [3]. That is, we need to begin by understanding the occurrence of disability and death due to a disease, which we call the burden of disease. In public health, disability is often called morbidity and death is called mortality. We also need to determine whether there has been a recent change in the impact of the disease. Thus, the first question we ask in describing a health problem is: what is the burden of disease in terms of morbidity and mortality and has it changed over time?

The second question we need to ask is: are there differences in the distribution of disease and can these differences generate ideas or hypotheses about the disease's etiology (cause)? That is, we need to examine how the disease is spread out or distributed in a population. We call this the distribution of disease. Public health professionals called epidemiologists investigate factors known as "person" and "place" to see if they can find patterns or associations in the frequency of a disease. We call these group associations. Group associations may suggest ideas or hypotheses about the cause, or etiology of a disease.

**Global Health**

Global health has changed rapidly and significantly over the past two decades and is now seen as a major issue in world politics [4]. As most health threats transcend borders and are influenced by factors that lie beyond the control of individual states, such as the environment, migration, and trade, it is often through global organizations (e.g. the World Health Organization) that they are addressed. While there are many definitions, the notion of governance refers to the ways in which society organizes and collectively manages its affairs. Governance is also often seen as incorporating the function of stewardship. At national level, the state is a key actor in governance, in the organization of different actors, and in the way policy responses to specific issues, such as health, are organized.

In global health, governance is distinct from that at national level as there is no global government. Rather, there is a myriad of actors, of which states are one, working on a wide range of issues but with no clear hierarchy except for the sovereignty of states. One of the features of global health and its governance over the past twenty years has been the proliferation of a wide range of state and non-state actors. This includes states who may seek to address transnational health concerns, such as avian influenza, to protect their population, or address an issue such as child malnutrition as part of a global solidarity agenda. States may become global health actors in their own right, or they may seek to pursue these issues

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through multilateral organizations, such as the WHO or UNICEF.

Making best use of limited resources—whether it is called rationing or priority setting—is a fact of life [5]. Limited resources need to be made to go as far as possible. This means saying ‘No’ to some people, whilst others benefit. This is not a comfortable thing to do, but one in which many people in public health are necessarily involved. Competition for resources may be the result of a new treatment becoming available, demand growing for treatment because of increased patient awareness or because more people in an ageing population need the treatment. The pressures of innovation, public participation, patient expectation, person-focused care, political policies, and socioeconomic factors make priority setting a vital part of public health practice in ensuring the health of the local population.

All health services have their different ways of organizing healthcare delivery and of making choices about which services will be provided within budgets set by funders; be they through taxation, insurance, or personal out-of-pocket spending. With limited resources comes the necessity to make difficult choices and the need to ensure best value for the finances available.

### Global Diseases

The world of biomedical science is rapidly changing at an international level at a rate which is frequently not fully appreciated [6]. Arising out of the genome project, we now understand in a lot more detail both the causes of monogenic disorders and the complexities of the genetic components of common human diseases such as diabetes, inflammatory arthropathies and gastrointestinal diseases such as celiac disease or inflammatory bowel disease. However, the genome project although providing huge quantities of data has only provided us with an introduction and a framework on which to base our understanding of human disease. Most importantly, we now appreciate that many diseases occur as a result of an interaction of a series of both environmental and genetic effects. Such interactions could best be illustrated by the example of coeliac disease, a condition also known as glutensensitive enteropathy, in which the host’s genetic background determines the susceptibility, but exposure to gliadin and related proteins from wheat and other cereals in the diet is the factor which provokes disease. We now have to begin to develop an understanding of the “exposome”, ie the disease provoking factors to which we are exposed and to develop the tools to catalogue such interactions and to understand their relationships with the genetic component of disease. The influence of such gene-environment interactions over generations can lead to development of populations which are skewed in a particular direction, as a result of both genetic and environmental factors. Hence, genes which contribute to auto-immune disease might also be favourable in terms of their capacity to skew immune responses towards stronger responses to bacterial or viral infection. In the international health arena conditions such as sickle cell disease represent the outcome of generations of interactions with infectious agents and the processes of natural selection which have enabled survival of the host.

### Epidemiology

Epidemiology is an academic discipline that determines the distribution of disease onsets and the causes of the development of diseases [7]. However, when causal relations between individual victims’ diseases and exposures are presumed based

on prevalence rates among populations, a point of connection between epidemiology and jurisprudence is created. Epidemiology carefully examines whether observational associations among particular events are genuinely causal relations. For example, if the incidence rates of gastric cancer are very high among those who drink coffee frequently, coffee must be defined as a carcinogen. However, because the confounder of smoking mediates in this case and that it has generated gastric cancer, coffee is not the true cause. Consequently, epidemiology involves the collection of data through various experimental and observational studies to classify causal relations. For example, most chronic diseases develop not due to single factors alone but due to the negative effects of many factors on the human body over a long period of time. In addition, because epidemiological research examines populations, it makes use of figures concerning relative risk, odds ratios, and attributable risk levels as indices expressing associations between instances of exposure to harmful factors and the development of diseases through a range of data.

The host population constitutes the reservoir for the pathogen; this is the biologic space that serves as the primary habitat for the pathogen [8]. Reservoirs are usually a collection of discrete organisms, which creates a problem for the pathogen, because to survive beyond the life of a particular host, it must find a way to spread to another host within its reservoir. First, it usually needs to reproduce within the host. Most pathogens reproduce extracellularly within the host, but a virus is unusual in that it can reproduce only after penetrating a host cell. While within a host cell, it is protected from the immune system, but it can be intercepted and deactivated by antibodies before entry into a cell. The specific immune response, which is a key defense against viral pathogens, typically does not occur rapidly enough to avert disease on the initial infection. It can take days for the antibody response to build, so those who lack previous contact are generally susceptible to infection from a virus. After an initial infection, the antibody response is typically rapid enough to prevent subsequent disease or at least to mitigate it, leading to immunity.

### Vaccine

Several societies have long realized that some diseases were contagious and those who recovered from such a disease had, second time around, a milder disease or did not become ill at all [9]. Astonishingly, with only that observation, and despite the lack of any knowledge on the cause on infectious diseases, some sort of “vaccination” developed in many societies more than 3,000 years ago (Chinese, Turks, Indians, Persians, Greeks, etc. For example, Chinese inhaled dried pus from smallpox lesions, while Turks also used shirts from the infected). Only after the work of scientific giants such as Antony van Leeuwenhoek, Lazzaro Spallanzani, Louis Pasteur, Robert Koch, Emil Von Behring, Ilya Mechnikov, Paul Ehrlich, etc., did we begin to understand infectious diseases and the rationale behind vaccination. Since then, tremendous advances have been made in the fields of microbiology and immunology. Armed with this wealth of information, “rational design of vaccination” seems feasible now.

Virus infections can be relatively localized, e.g., to the respiratory or alimentary tracts (a more challenging situation for the induction of protective immunity) or they may spread systemically first via the lymph and then through the blood, where opportunities for engaging the major sites of immune induction are plentiful [10]. Virus infections may be acute and followed either by death or by

complete viral elimination; they may set up a latent infection, going underground in particular cells, only to reemerge sporadically and unpredictably, as with herpes viruses; or they can set up a chronic infection as in hepatitis B or C. Knowing the respective life histories of the viruses is important to devising appropriate vaccine research strategies.

Vaccination is a method of introducing living modified or artificially obtained viral or bacterial agents into the body with a goal to imitate a natural infection and intentionally creation an immune reaction- by creating an antibody [11]. When they meet the cause, such antibodies protect the body and prevent diseases from severe illness. Vaccination is applied by taking it as a solution in the mouth or by injection into the muscle. Vaccination is considered like one of the greatest health achievements in the twentieth century in the field of medicine as a scientific discipline and the most successful applied public health method for suppression diseases.

### Global Health Law

Global health law is a field that encompasses the legal norms, processes, and institutions needed to create the conditions for people throughout the world to attain the highest possible level of physical and mental health [12]. The field seeks to facilitate health-promoting behaviour among the key actors that significantly influence the public's health, including international organizations, governments, businesses, foundations, the media, and civil society. The mechanisms of global health law should stimulate investment in research and development, mobilize resources, set priorities, coordinate activities, monitor progress, create incentives, and enforce standards. Study and practice of the field should be guided by the overarching value of social justice, which requires equitable distribution of health services, particularly to benefit the world's poorest populations.

Globalization has limited the capacity of governments to protect health within their sovereign borders through unilateral action alone, and national and international health are increasingly recognized as intertwined and inseparable [13]. In addition, the idea that governments have human rights responsibilities to protect and promote public health and can and should be held accountable domestically and internationally for their actions is gaining widespread acceptance. In this new era of global health governance, international law has an important role to play in promoting and coordinating international cooperation and national action.

International agreements, binding and nonbinding, are now at the core of contemporary cooperation in global health. The effective design and management of global health law is one of the major challenges for global health governance in this century. Recent developments in global health law and diplomacy have led to increasing calls for international lawmaking and, in particular, the codification of treaties to serve as a framework for global governance. However, it is important to recognize that international law is not an appropriate policy instrument for all global health problems. Given the substantial limitations of international law and the international legislative process, careful consideration should be given to the selection of global health concerns and the construction of legal regimes in the future. Policymakers must give high priority to identifying if and how legal strategies can contribute to the agenda in international health cooperation, including, most importantly, the major challenges that plague many developing nations. At the same

time increased attention should be paid to the impact, both positive and negative, of existing international law on population health.

No government or institution—not even those with unlimited resources—can guarantee complete physical and mental well-being [14]. What governments can be held accountable for is assuring the conditions in which people can be healthy. Individuals are embedded in built and natural environments that determine their well-being in fundamental ways. They are dependent upon government to ensure the provision of health services to prevent and treat injury and illness. They depend on basic socioeconomic foundations for a healthy, productive, and fulfilling life. What, then, are the essential conditions in which people can be healthy? Put simply, three conditions of life would give everyone a fairer opportunity for good health: (1) public health services on a population level; (2) health care services to all individuals; and (3) the socioeconomic determinants that undergird healthy and productive lives.

### Conclusion

Medicine for Global health says it is a health problem that goes beyond the area and national boundaries, can affect the circumstances and experiences in other countries, and it is therefore best to point to cooperative global action and resolution. However, it is not only a health problem that crosses borders or is common in different countries around the world; solutions to this problem cross borders and seek participation depending on the degree of development. All countries can learn from each other simultaneously and share their own experiences and information at the same time. The state of Global health can be determined through global disease loads, which enables an assessment of the importance of disease, injury and risk factors in different populations of the world, which would then serve as a basis for planning research, development, health policy creation and funding.

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