

CHAPTER 1



Introduction and Historical Perspectives

KEY CONCEPTS

- Ayurveda
- Codex Hammurabi
- Corpus Hippocraticum
- Ebers papyrus
- Edwin Smith papyrus
- germ theory of disease
- global health
- health
- historic period
- international health
- Kahun papyrus
- medical model
- Middle Ages
- prehistoric period
- primary health care
- public health
- *qi*
- Taoism
- theory of contagion
- *ticiotl*
- *tridosha* theory of disease
- *Unani* system
- *yang*
- *yin*
- yoga

AFTER READING THIS CHAPTER YOU SHOULD BE ABLE TO

- Define health, international health, and global health
- Differentiate between medicine and public health
- Describe common issues in international health
- Explain the salient contributions to international health from the ancient civilizations of India, Mesopotamia, Egypt, China, Greece, Rome, Mexico, and Central and South America
- Discuss the development of international health in the Middle Ages, Renaissance, early modern times in Europe, Industrial Revolution, and modern times
- Summarize the contribution of salient international organizations in the field of health

HEALTH

Before trying to understand international health, let us first begin by understanding what **health** means. *Health* is a very old term. In old English it was used as *haelen*

(to heal), and in middle English as *helthe*, meaning to be sound in body, mind, or spirit. The word was related to the practice of medicine. In ancient Greek civilization the definition of medicine was to “prolong life and prevent disease,” or, in other words, to keep people healthy (Cook, 2004). Similarly, medicine in ancient India was called **Ayurveda**, or the science of life or health. By the 17th century, the word *restoration* began to be used in most medical textbooks. By the end of the 19th century the word *health* was considered colloquial and was replaced with the word *hygiene*, which was considered more scientific (Cook, 2004).

After World War II, interest in the word *health* resurfaced with the formation of the World Health Organization (WHO), a global entity. Around the same time, the Hygienic Laboratory in the United States was renamed the National Institutes of Health. In 1948, the World Health Organization defined health in its constitution as “a state of complete physical, mental, and social well being and not merely the absence of disease or infirmity” (WHO, 1974). However, this definition of health has received much criticism over the years.

First, the use of the word *state* in this definition is misleading. Health is dynamic and changes from time to time. For example, a person may be healthy in the morning; in the afternoon, he or she develops a headache and is thus not in the “state” of health; in the evening, he or she may recover from the headache, thereby attaining the “state” of health again.

Second, the dimensions as mentioned in the definition are inadequate to capture variations in health. One such dimension is the political dimension. Do the rich get sick more often or is it the poor? Who controls greater resources for health? Which section of the population has a greater burden of mortality? All these and many more such questions pertain to the politics behind health. This dimension must be explicitly mentioned in the definition for it to be meaningfully complete. Another dimension that is not mentioned in the definition of health is the spiritual dimension (Perin & McDermott, 1997). Bensley (1991) has identified six different perspectives related to the spiritual dimension of health, namely, sense of fulfillment, values and beliefs of community and self, wholeness in life, well-being, God or a controlling power, and human-spiritual interaction. These perspectives are not mentioned in WHO’s original definition.

Third, the word *well-being* is very subjective in its connotation. A definition must be objective, and subjectivity must be minimized. Fourth, the way health is defined makes it very difficult to measure. McDowell and Newell (1987) point out that “just as language molds the way we think, our health measurements influence (and are influenced by) the way we define and think about health” (p. 14); in other words, health and measurement are inextricably linked. Fifth, the way health is defined presents

an idealistic or utopian view. It would be impossible to find someone who embodies all the attributes presented in the definition. Thus, the definition of health needs to be more realistic. Sixth, health is presented as an end product in the definition, whereas most people perceive health as a means for achieving something that they value more. For example, a person may want to be healthy so that he or she can raise a family. Finally, the WHO definition of health is written from an individualistic perspective in which health is defined for one person. It lacks the community orientation that is needed for something that is as complex as health.

Since the original WHO definition was published, it has been further modified in subsequent discussions at the world level. In November 1986, the first International Conference on Health Promotion was held in Ottawa, Canada (WHO, 1986). The conference culminated with the drafting of the Ottawa Charter for Health Promotion, wherein health was defined in a broader perspective:

[H]ealth has been considered less as an abstract state and more as a means to an end which can be expressed in functional terms as a resource which permits people to lead an individually, socially, and economically productive life. Health is a resource for everyday life, not the object of living. It is a positive concept emphasizing social and personal resources as well as physical capabilities.

PUBLIC HEALTH AND MEDICINE

Building further on the concept of health in order to appreciate international health, we have to understand the terms **public health** and **medical model**, two concepts that have shaped international health. Winslow (1920), a professor at Yale University, defined public health as:

the science and art of preventing diseases, prolonging life, and promoting physical health and efficiency through organized community efforts for the sanitation of the environment, the control of communicable infections, the education of the individual in personal hygiene, the organization of medical and nursing services for the early diagnosis and preventive treatment of disease, and the development of social machinery, which will ensure to every individual a standard of living adequate for the maintenance of health; organizing these benefits in such a fashion as to enable every citizen to realize his birthright of health and longevity.

This definition makes it clear that public health deals with disease prevention and health promotion. It is also evident that an organized community effort is used as a fundamental approach in public health. Public health is also a profession and discipline. The ultimate aim of public health is to ensure social justice.

Medicine, on the other hand, is about diagnosing and treating diseases. Merriam-Webster's online dictionary defines medicine as "the science and art dealing with the maintenance of health and the prevention, alleviation, or cure of disease." The approach of medicine is different from that used in public health. In medicine the emphasis is on an individual patient, and the doctor is concerned with diagnosing and treating his or her illness; in public health, the emphasis is on populations.

In the medical model, the patient is usually absolved of personal responsibility and is prescribed an external agent, such as a drug, to rid himself or herself of the ailment. In public health, however, personal responsibility is greater and the person has to mobilize social and political forces in dealing with the problem. In the medical model, the focus is on the curative dimension, whereas in public health, the focus is on preventive approaches. The main work in medicine is that of the diagnosis and treatment of illnesses, whereas public health is more concerned with reducing risk factors for physical diseases as well as mental and social problems. In medicine the benefit to the individual is supreme, whereas in public health the philosophy of the greatest good for the greatest number holds. The medical model is very expensive—the cost for saving a single individual can go into millions of dollars—whereas the public health model is very inexpensive when one computes cost per person. The medical model is highly technocentric, whereas the public health model usually relies on people and indigenous technologies. The medical model creates dependency, whereas the public health model is liberating.

Philosophically, the medical model seeks to maximize the chance that the best possible outcome will occur, whereas the public health model seeks to minimize the chance that the worst possible outcome will occur. In medicine, the inputs of the basic sciences are narrow and focused, whereas in public health basic science inputs are broader. The medical sector is highly commercialized compared with the public health sector. Finally, whereas in medicine the primary goal is to rid a person of his or her suffering, in public health the goal is to ensure social justice. **Table 1.1** summarizes these differences between the public health model and the medical mode.

INTERNATIONAL HEALTH AND GLOBAL HEALTH

The terms *international health* and *global health* are often used interchangeably, although there are subtle differences between them. These terms have been defined in several ways in literature, and there is no consensus on their definition. Paul Basch (1999) has defined international health as "a systematic comparison of the factors that affect the health of all human populations." International public health has been defined as "the

TABLE 1.1 Differences Between the Medical Model and the Public Health Model

Medical Model	Public Health Model
Emphasis on the individual	Emphasis on the population
No or minimum personal responsibility	The person is responsible for organizing and influencing societal and political forces
Focus on curative dimension	Focus on preventive dimension
Diagnosis and treatment of syndromes and diseases afflicting the physical condition of an individual (although extensions are made to mental and social problems)	Reduction of risk factors for physical diseases as well as mental and social problems
Benefit to the individual is supreme	Greatest good to the greatest number
Expensive	Inexpensive, especially in terms of investment per person
Highly technocentric	Relies on people and indigenous technologies
Creates dependency	Liberating
Seeks to maximize the chance that the best possible outcome will occur	Seeks to minimize the chance that the worst possible outcome will occur
Basic science inputs are narrow and focused	Basic science inputs are broader
High commercialization	Low commercialization
Ultimate goal: Rid a person from suffering	Ultimate goal: Social justice

application of principles of public health to health problems and challenges that affect low and middle income countries and to the complex array of global and local forces that influence them” (Merson, Black, & Mills, 2006, p. xiv). We define **international health** as the science and art of examining health problems in multiple countries, primarily those that are developing, and finding population-based solutions to their problems.

A related term is **global health**. The Institute of Medicine (1997) has defined global health as “health problems, issues, and concerns that transcend national boundaries, may be influenced by circumstances or experiences in other countries, and are best addressed by cooperative actions and solutions” (p. 11). The health problems

addressed in global health are often outbreaks of communicable diseases, maternal and child health problems, population issues, natural disasters, war, environmental health issues, and other large-scale afflictions. These problems are very similar to those encountered in international health and, therefore, these two terms are often used interchangeably. In our opinion, however, there is a subtle difference between international health and global health, and the term *global health* should be used only when *all* countries are involved both in the problems and the solutions. Therefore, we define global health as the study of health problems and solutions affecting all people of the world.

ISSUES IN INTERNATIONAL HEALTH

This book is primarily concerned with issues confronting international health. Some of the questions that a student of international health needs to be able to address are as follows:

- What are some common international organizations? What role do these international organizations play in maintaining health around the world?
- How are various aspects of international health measured? What are the health indicators in international health?
- What is the role of culture in shaping health? How do behaviors influence health?
- What communicable diseases affect people of the world? Do developing countries have a greater burden of communicable diseases or do developed nations?
- What are lifestyle risk factors, and which noncommunicable diseases affect the people of the world?
- How does malnutrition affect the countries of the world? What are some specific micronutrient deficiencies and their distribution around the world?
- How does environment affect health? Is population explosion a problem in the world, and what are some measures being taken in this regard? How do air pollution and water pollution affect health for people around the world?
- What are some key concerns for women's health around the world?
- What are the determinants of children's health in different countries? How do infant mortality rates vary from country to country?
- What are the variations in mental health systems around the world?
- How do the health systems in developed and developing countries vary?
- What is the effect of globalization on health? What are some emerging diseases and what is their impact on human health around the world?
- How does poverty affect health? What are the threats of biological terrorism and warfare?

MEDICINE AND PUBLIC HEALTH THROUGHOUT HISTORY

The Indus Valley Civilization and the History of India

Modern humans evolved in Africa and have lived on our planet for about 150,000 years (Misra, 2001). The time during which there were no written records is called the **prehistoric period**. Humans learned writing only 5,000 years ago, at which point the **historic period** began. The prehistoric period is divided into three ages: the Stone, Bronze, and Iron Ages. The Stone Age, in which technology was based primarily on stone, is divided further into three periods: the Paleolithic, Mesolithic, and Neolithic. In the Neolithic period, humans started agriculture and animal husbandry. These developments led to urbanization; the first such urbanization is known as the Indus Valley or Harappan civilization, which flourished from 3500 to 1500 BCE. It was located around the Indus and Ghaggar-Hakra rivers in what is now northwestern India and Pakistan.

The Indus Valley civilization is among the three oldest civilizations of the world, the other two being Mesopotamia and Egypt. The economy of the Indus Valley civilization was based on wheat, barley, and millets. The Indus Valley civilization is known for its planned cities, which consisted of a citadel for the upper classes and a lower town for the common people. Both kiln- and sun-baked bricks were used in construction. The advanced architecture of the Indus Valley civilization is evidenced by dockyards, granaries, warehouses, brick platforms, and protective walls. From a sanitation perspective, it had an excellent drainage system consisting of both public and private drains (Marshall, 1931). There is evidence that municipal laws ensured the cleanliness of public areas and prohibited encroachment on them (Sharma, 1956). This civilization showed the first evidence of the practice of public health. Several factors led to the decline of this civilization, such as a shifting of the course of the river, a reduction in rainfall, foreign invasions, migration of the people, and environmental degradation (Misra, 2001).

This civilization in the Neolithic and Bronze Age paved the way for the Iron Age Vedic civilization (2000–600 BCE). The period is characterized by the development of *Vedas*, or the scriptures of teachings. Initially the Vedas were transmitted orally from one generation to another. They were eventually written in Sanskrit and primarily consist of four collections: the *Rig-Veda*, the *Sama-Veda*, the *Yajur-Veda*, and the *Atharva-Veda* (Hines, 1999). Collectively, these are referred to as the *Sambitas*.

It is believed that the system of Ayurveda, or the science of life or health, also originated during this time from the *Atharva-Veda* (Park & Park, 1986; Subbarayappa, 2001). Both the *Rig-Veda* and *Atharva-Veda* allude to the fact that diseases are caused by congenital factors (*ksetriya*), infection, seasonal change, or minute organisms or insects (*krmi*) residing in the body (Subbarayappa, 2001). The *Atharva-Veda*

describes surgical operations to remove arrows. Ayurveda had eight branches: *Kayacikitsa* (internal medicine), *Salya tantra* (surgery), *Salakya tantra* (ophthalmology and otolaryngology), *Kaumara brbtya* (pediatrics, obstetrics, and gynecology), *Agada tantra* (toxicology), *Rasayana* (geriatrics and nutrition), *Vajikarana* (sexology), and *Bhuta Vidya* (psychiatry and demonology) (Subbarayappa, 2001). Two classic texts of Ayurveda are the *Charaka* and *Susruta Samhita*. Ayurveda believes in *Pancha Bhutas*, or the five elements: space, air, fire, water and earth. A hallmark of Ayurveda is the **tridosha theory of disease**. The *doshas*, or humors, are *vata* (wind), *pitta* (gall), and *kapha* (mucus). Diseases were explained as disturbances in these three humors.

The system of **yoga** also originated during this time. The word *yoga* is derived from the Sanskrit word meaning “union.” It is an ancient system of physical and psychic practice to maintain balance. In a more modern context, yoga has been defined as “a systematic practice and implementation of mind and body in the living process of human beings to keep harmony within self, within society, and with nature” (Maharishi, 1992, 1998). The first written records of this methodology appeared around 200 BCE in the *Yogasutra* of Patanjali (Singh, 1983). The system consisted of the eightfold path, or *Asthangayoga*. The eight conventional steps of *Asthangayoga* consist of *Yama* (rules for living in society), *Niyama* (self-restraining rules), *Asana* (low physical impact postures), *Pranayama* (breathing techniques), *Pratibara* (detachment of the mind from senses), *Dharana* (concentration), *Dhyana* (meditation), and *Samadhi* (complete union with superconsciousness) (Romas & Sharma, 2010). The techniques of yoga are perhaps the most remarkable contributions of this era in the field of health.

One not knowing a land asks of one who knows it,
he goes forward instructed by the knowing one.
Such, indeed, is the blessing of instruction,
one finds a path that leads him straight onward.

—Rig Veda 10.32.7

Ancient Civilization in Mesopotamia

The civilization in Mesopotamia (*meso* meaning “middle” and *potamia* meaning “river,” implying a land between two rivers) flourished between the rivers Euphrates and Tigris in the period 6000 BCE to 400 BCE through the Neolithic Age to the Iron Age. It was located in the region where present-day Iraq is located, called the “cradle of civilization.” The people who started the civilization were called Sumerians. They developed a system of cuneiform writing on wet clay tablets. Several medical texts, known as treatises, were written on these tables. Many of these were found in the library of the King of Assyria, Assurbanipal. When his palace was burnt by invaders,

the clay tablets were baked and thus preserved. The longest treatise is known as the “Treatise of Medical Diagnosis and Prognoses” (Wolf, 1999). This text consists of 40 tablets studied by the French scholar Labat. The diagnostic treatise is arranged from head to toe and includes subsections on convulsive disorders, gynecology, and pediatrics. During that period it was believed that many illnesses were caused by ghosts, and magico-medical treatments were used to treat such illnesses (Scurlock, 2006). Ceremonial acts such as tying knots and wearing amulets were used as part of treatment (Bock, 2003). No treatises on surgery have been found, but it is believed that surgery was also practiced (Adamson, 1991). The art of bandaging was introduced in this civilization, as was the collection of medical treatises.

One of the great kings of Babylon was Hammurabi (1810–1750 BCE), who is well known for developing a set of laws called *Hammurabi’s code*, or **Codex Hammurabi**. The code contained more than two hundred laws. Some of the laws governed the conduct of physicians and ensured that they got paid, the first example of the codification of medical practice. Spiegel and Springer (1997) draw a parallel between Codex Hammurabi and the managed care of present times. They argue that Codex Hammurabi, similar to present-day managed care, established a schedule of sliding fees for services and advocated the use of outcome measurements and, in the event they were not met, meted out severe penalties. The code required medical records to document diseases and therapies and included prescription benefits. It fully explained patients’ rights. The model of managed care in those days was authoritarian, unlike present times, but there were definitive legal actions to ensure justice for everyone in the kingdom. Thus, Codex Hammurabi can be considered as a precursor of present-day managed care.

Ancient Civilization in Egypt

The civilization in Egypt developed in northeastern Africa around the river Nile in the period from 3000 BCE to 300 BCE. The civilization is known for its pyramids and sphinxes. A great deal is known about this culture because they invented picture writing and recorded it on papyrus. The main sources for studying Egyptian civilization have been surviving papyri, which have been translated into modern languages.

The **Edwin Smith papyrus**, dating back to around 1700 BCE, was discovered in 1862 outside of Luxor, Egypt (Stiefel, 2006). It is believed to be a copy of an original written in 3000 BCE. It is considered to be the oldest known surgical text in the history of civilization. This papyrus is divided into 48 cases, arranged by anatomic region, that primarily describe several traumatic injuries and their management. The unique feature of the text is that it describes the art of patient examination based on signs and symptoms and using logic and deductive reasoning.

Another papyrus is the **Kahun papyrus**, which dates back to about 1900 BCE and deals primarily with gynecological matters (Okasha, 2001). It talks about hysteria as a displacement of the uterus. It also talks about suggestion being an important part of all forms of treatment. One of the psychotherapeutic methods used in Ancient Egypt was “incubation,” or “temple sleep,” in which patients were placed in a deep sleep with the help of drugs such as opium. The originator of these forms of remedies seems to be Imhotep, physician of the pharaoh Zoser.

The **Ebers papyrus** was purchased in 1872 by the Egyptologist George Ebers, after whom it is named, and is believed to have originated in 1550 BCE. It is 110 pages long and is the lengthiest surviving medical papyrus. It has more than 800 paragraphs, each of which deals with a different medical ailment and its management.

In the area of public health, Egyptians built planned cities and public baths, had a system of collecting rain water, and built underground drains (Green & Ottoson, 1999; Park & Park, 1986). They also had knowledge of mosquito nets for the prevention of mosquito bites. Herodotus, a Greek historian, visited Egypt in the fifth century BCE and commented on the hygienic practices of Egyptians. He found Egyptians to be fond of cleanliness, taking frequent baths and using earth closets for human wastes (De Selincourt, 1962).

Ancient Civilization in China

China is one of the world’s oldest continuous civilizations, dating back more than 6,000 years. There is evidence from inscriptions on tortoise shells that people dug wells for drinking water during the Xia (21st century BCE) and Shang (11th century BCE) dynasties (Green & Ottoson, 1999). Around the 14th or 13th century BCE, during the Shang dynasty, it was believed that ailments were caused by the curses of dead ancestors, and methods of healing such as prayers, offerings, and incantations were performed (Subbarayappa, 2001).

An emperor physician, Huang Di, or the Yellow Emperor of China (2695–2589 BCE) is credited with initiating systematic Chinese medicine (Cheng, 2001). Huang Di emphasized the importance of the principles of *yang* and *yin* everywhere in creation. *Yang* is the masculine principle, and *yin* the feminine principle. Balance between these two signifies good health. *Yang* and *yin* generate five phases: water, fire, earth, wood, and metal. Chinese herbal therapy was based on these five phases. Huang Di also supported the use of acupuncture in Chinese medicine, which arose around 2600 BCE (Cheng, 2001). He emphasized prevention of diseases, saying, “The superior doctor prevents diseases; the mediocre doctor attends to impending diseases; the inferior doctor treats full blown diseases.” Another concept of Chinese medicine

is that of *qi*, which is the basis of activities of body and mind and is the primordial entity of both material (body) and nonmaterial (mind) things, gross and subtle (Subbarayappa, 2001).

Lao Tse, or Lao Tzu (which literally means Old Master), who lived around the 6th century BCE, developed the philosophy of **Taoism** (Khoo, 1998). His teachings

*By nature the men are alike.
Through practice they have
become far apart.*

—Confucius (541–479 BCE)

disseminated the philosophy of the *Tao* (or the Way), which refers to a reality that naturally exists from primordial time and gives rise to all other things. *Tao* can be found by experiencing oneness in all things. Taoists introduced the idea of healing by drugs and used alchemy.

Another well-known Chinese philosopher who influenced

Chinese medicine and public health is Confucius (541–479 BCE). His philosophy emphasized correctness of social relationships along with personal and governmental morality. Regarding traditional and modern treatments, Confucius said: “Because the new methods of treatment are good, it does not follow that the old ones were bad; for if our honorable and worshipful ancestors had not recovered from their ailments, you and I would not be here today” (Huth & Murray, 2000).

Greek Civilization

In early Greek civilization, Apollo, the Sun God, was considered to be the protector from epidemics such as plague. In Greek mythology, Aesculapius was the son of Apollo (Schmidt, 2007). He was raised by Charion, who taught him the art of healing. Aesculapius had two daughters: Hygiea, who was worshipped as the goddess of health, and Panacea, who was worshipped as the goddess of medicine. Thus we see an early dichotomy between prevention and cure in Greek thought. Around 776 BCE, the Olympic Games were founded; they initiated a movement toward good physique and physical fitness that had an influence on healthy living (Porter, 1997).

It is believed that the roots of medicine the way it is practiced today can be traced back to the 5th century BCE, when Hippocrates introduced a rational way of treating

*Make a habit of two things:
to help; or at least to do
no harm.*

—Hippocrates (460–357 BCE)

diseases (Cilliers & Retief, 2006). Hippocrates, often called the Father of Medicine, wrote a body of writings known as the **Corpus Hippocraticum**, a compilation of around 70 books. Classical Greek medicine involved four humors (blood, phlegm, black bile, and yellow bile), four elements (earth, air, fire, and water), and four qualities (hot, cold,

moist, and dry). Any imbalance in these caused disease. The system was rational because it was devoid of superstition and religion and was based on experimentation.

Also, the training of a physician was done by apprenticeship under another physician. Another important feature of Greek civilization was the development of an ethical code of conduct for physicians. The Hippocratic Oath is still used today in many parts of the world by physicians. Most physicians in Greek civilization were men (*iatroi*), but there were also women doctors (*iattrinai*).

Plato, a Greek philosopher, showed that medicine and philosophy were inextricably linked (Stempsey, 2001). He advocated holistic medicine, in which cure of the body alone without cure of the soul is not a whole cure. Holistic health involves uniting both body and soul; thus, along with medical technology, philosophy is needed for complete healing to take place. He also emphasized the role of personal responsibility in maintaining health and favored prevention rather than cure.

The urban sewerage and storm water drainage systems in ancient Greece during the Minoan period (second millennium BCE) were quite advanced (Angelakis, Koutsogiannis, & Tchobanoglous, 2005)—comparable to modern urban water systems developed in Europe and North America during the second half of the 19th century CE. These advanced systems were exported to all parts of the Greek civilization in the Mycenaean, Archaic, Classical, and Hellenistic periods.

Roman Civilization

In earlier times, medicine in Roman civilization was based on folk remedies, herbs, religious influences, and superstition. Around the fourth century BCE, Greek medicine started entering Rome (Cilliers & Retief, 2006). In order to practice medicine in the Roman Empire, physicians only needed permission from a magistrate. Julius Caesar exempted physicians from paying tax and gave them citizenship. This practice was upheld by subsequent emperors such as Augustus, Vespasian, and Hadrian. The introduction of Greek practices also systematized medicine, including the process of childbirth. Use of rational, scientific techniques by midwives improved outcomes for both mothers and children (Todman, 2007). Galen (130–205 CE) was a well-known physician and medical teacher of the Roman civilization who contributed to the advancement of techniques in medicine. His approach was more analytic than the Hippocratic approach (Park & Park, 1986). He is the author of more than 500 treatises, which were considered authoritative during his time.

The great contribution of the Roman Empire was in the area of public health. The empire constructed the massive Cloaca Maxima in the sixth century BCE, which drained the marshes of central Rome and later served as a sewer (Cilliers & Retief, 2006). The Romans also had an elaborate system of aqueducts for water, which supplied about 50 gallons (189 liters) of water per person per day (Major, 1954).

Another development in the Roman Empire was that of an efficient health care system for the military. A team of physicians (*milites medici*), who were mostly Greek, accompanied the army. Soldiers were also given first aid training. Dioscorides, an army surgeon, wrote a pharmacopeia, *Materia Medica*, in 77 CE.

In 166 CE a plague broke out in Roman Empire that was one of the reasons for its downfall (Fears, 2004). The pandemic devastated the entire Roman Empire, extending from its eastern frontiers in Iraq to its western frontiers on the Rhine River and Gaul.

Middle Ages

European history is divided into three time periods: the classical civilization of antiquity, which covers the Greek and Roman civilizations; the **Middle Ages** (between 500 CE and 1500 CE); and modern times. During the Middle Ages there was very little progress in medicine and public health; it is, therefore, also known as the Dark Ages. During this period the influence of the Church and associated dogma increased in the lives of common people. Great expenditures were made on Crusades, or Holy Wars. The average life expectancy was a mere 31 years (Glasscheib, 1964). During these times the role of women as healers was challenged (Minkowski, 1992). They were excluded from admission to universities and professional schools of medicine. In addition, the Church branded women healers as witches, and many women healers were persecuted.

While Europe was passing through the Dark Ages, the Arabs, borrowing from the Greeks and Romans, developed their own medical system, known as the **Unani system**. Unani medicine is still practiced widely in the south and southeast parts of Turkey to Saudi Arabia and in other parts of Asia, such as India and Pakistan (Yesilada, 2005). The Unani system utilizes herbs and folk remedies and is also influenced by Ayurveda (Subbarayappa, 2001). Abu Bakr Muhammad Ibn Zakariya al-Razi (also known as Rhazes) (865–925 CE) wrote the book *Kitab al-hawi fi al-tibb*, also known as *Liber continens*, which became a standard reference medical compendium (Browne, 1921). The book contained the first accurate account of smallpox. Another well-known physician of those times was Abu Ali al-Husayn ibn Abd Allah ibn Sina (980–1037 CE), who is also known as Avicenna in the West. He wrote the book *Kitab al-Qanun fi al-tibb*, or *Canon of Medicine* (Shah, 1966). According to the Unani system, the human body and health were made up of seven components: elements (*Al-Arkan*), temperament (*Al-Mizaj*), four humors (*Al-Akblat*), organs (*Al-A'da*), vital spirit (*Al-Arwab*), faculties (*Al-Quwa*), and functions (*Al-Afal*). The four elements were earth, fire, water, and air, and the four humors were blood, bile, phlegm, and black bile. Prevention and self health care were important components of this system.

Mayans, Incas, and Aztecs

Some of the civilizations of ancient peoples in the Americas have included those of the Mayans, Incas, and Aztecs. The Mayan civilization spanned five modern-day countries: Belize, El Salvador, Guatemala, Honduras, and Mexico. It is believed that the Mayans migrated from the north to the highlands of present-day Guatemala around 4000 BCE (Herrera, Rojas, & Terreros, 2007). Their civilization was village based and primarily agricultural. The culture of the Mayans originated from the earlier Olmec civilization, which flourished in the southern portion of North America. It is known that the civilization dug fresh water wells and used limestone in construction. They were well known for their advanced calendars and their knowledge of astronomy. Mayans also developed an elaborate system of herbal drugs based on having access to the world's third richest area in terms of diversity of plants (Borchardt, 2004). Recent studies have shown some of the plants used by Mayans to be helpful for gastrointestinal ailments, dermatologic conditions, and diabetes (Ankli et al., 2002). Some of the remedies developed by the Mayan civilization are still being used by modern practitioners (Blanchard & Bean, 2001).

The Inca civilization originated around the 13th century in modern-day Peru and spread to Ecuador, western and south-central Bolivia, northwest Argentina, north and north-central Chile, and southern Colombia. Medicine was well developed in the Inca Empire (Burneo, 2003). There is an account that melancholy was present in the family of the emperor (Elferink, 1999), which was treated with a combination of magic and empirical medicinal products composed of botanical compounds and minerals. Epidemics of smallpox, typhus, influenza, measles, and diphtheria between 1546 and 1618 were important pestilences that were a contributory factor in the decline of this civilization.

The Aztecs were an ethnic group that existed from the 14th through 16th century in Mexico. Aztec medicine, called *ticiotl*, used plants and herbs in the treatment of diseases (Pena, 1999). The Aztec doctors (*titicib*) knew about several diseases and dealt with the treatment of wounds and fractures methodically. Their system was different from that used in the Greek and Roman cultures. The public health system in Aztec society was well developed. Harvey (1981), in his paper on public health in Aztec society, notes that the cities in Mexico were beautiful and orderly and that Aztecs disdained noxious odors. Clay conduits were used to transport drinking water. In the houses of the nobility, water was stored in ponds, and *ajolotes* (a type of salamander) were kept in the water to keep it clean. Disposal of the dead was done by cremation.

Renaissance and Early Modern Times in Europe

The Middle Ages in Europe gave way to a cultural movement called the Renaissance (1420–1630), in which a revival of science, art, and culture occurred. This period dovetailed with the period from the 15th to 18th century that is also referred to as early modern times. During this time, Paracelsus (1493–1541), a Swiss-born physician who was known as the Luther of Medicine, publicly burned the work of Avicenna and tried to restore rational research to medicine (Debus, 1998). The Italian physician Hieronymus Fracastorius (1478–1553), who was also a poet, astronomer, and geologist, proposed the **theory of contagion** in his book *De Contagione* almost 300 years before the experimental development of the germ theory by Robert Koch. He proposed that the transfer of infection in epidemics occurred via minute imperceptible particles (Wright, 1930).

Andreas Vesalius (1514–1564) conducted several dissections of the human body and corrected the earlier notions of Hippocrates and Galen. Another well-known English physician during these times was Thomas Sydenham (1624–1689), who wrote the book *Medical Observations Concerning the History and Cure of Acute Diseases*, published in 1666 (Sydenham, 1666/1979). He is known as the English Hippocrates, or the Father of English Medicine (Low, 1999).

Anton van Leeuwenhoek (1632–1723), a Dutch city hall janitor, developed a microscope and saw bacteria in his dental scrapings (Shklar, 1998). However, he was never able to associate bacteria with disease. Edward Jenner (1749–1823), a British physician, developed the smallpox vaccine in 1796 (Stewart & Devlin, 2006). He took matter from pustules on the arm of a milkmaid who had developed cow pox and vaccinated that on a young boy. Later he demonstrated that the boy was immune when inoculated with smallpox. This marked the era of prevention of diseases by vaccination, a specific form of disease protection.

European Colonial Expansion

From 1600 to 1800, the Europeans (British, Dutch, French, Portuguese, and Spanish) colonized North America, Australia, Africa, Asia, and South America. The health of the people in the colonies was rather poor and epidemics were rampant. Action was taken only during epidemics and was in the form of isolation and quarantine (Green & Ottoson, 1999). The general tendency of the colonizers was to impoverish the natives and downplay their culture and medical systems.

Slavery was also at an all-time high during this period. The slave trade was very profitable for those who were involved in it, including Queen Elizabeth I of England (Basch, 1999). Slaves were primarily taken from Africa to America. Several diseases moved along with the slave trade from one continent to another. For example, treponemal disease

(comprising syphilis, yaws, and bejel) originated in East Africa and was later transmitted to England (Rothschild, 2005). However, some diseases that required special animal hosts could not be transmitted, such as schistosomiasis, or flatworm disease. Urinary schistosomiasis is caused by *Schistosoma haematobium*, which was introduced in the Americas but could not get established for want of a suitable snail host (Basch, 1999).

The Industrial Revolution

The Industrial Revolution occurred in the late eighteenth and nineteenth centuries in Europe and North America. Industrialization in its early years led to poverty and disease among the masses. Working and living conditions for workers were poor, and sanitation was a problem. In 1832 there was a great cholera epidemic, which was investigated by a lawyer and “freelance civil servant,” Edwin Chadwick (1800–1890). In 1838 to 1839, consumption (what is now known as tuberculosis) caused the deaths of 60,000 people in England and Wales (Brown, 2006). Fevers such as typhus and typhoid were endemic in most industrial towns and cities, and there were epidemics of influenza in 1837 and typhoid in 1838.

Edwin Chadwick was asked to carry out an investigation into sanitation, and in 1842 he published *The Sanitary Conditions of the Laboring Population*, a report in which he argued for improvement in sanitation. It is interesting to note that, fueled by this report, the first public health legislation in Britain was not for better wages or social welfare, but for sewerage (Brown, 2006). This was the Public Health Act of 1848 (Hamlin & Sheard, 1998). This act was developed well before the discoveries in bacteriology and pathology, but it was quite comprehensive (Calman, 1998). It covered poverty, housing, sewerage, water, safety, environment, and food. It had a strong component of local involvement and identified responsible people and penalties. What it did not cover was air quality and rural health. The act set out central and local boards of health with superintending inspectors and officers of health. These were linked to the Treasury for funds.

Another well-known public health physician during those times was John Snow (1813–1858), who studied the spread of cholera in London between 1848 and 1854 and led to its prevention. His contribution is summarized in Focus Feature 1.1. The Central Board of Health that was established in the Public Health Act of 1848 lasted until 1854 (Southgate, n.d.). The local boards wanted more power and that power was shifted to them by the Public Health Act of 1875. The 1875 act also gave additional tasks to local governments, such as construction and maintenance of parks, public houses, and special hospital isolation units for patients suffering from infectious diseases such as smallpox.

FOCUS FEATURE 1.1 John Snow and His Work with Cholera

John Snow (1813–1858) was the first of nine children in a farmer family in York, England (Lee, 1898). He was interested in medicine and apprenticed under William Hardcastle, a surgeon living at Newcastle-on-Tyne. He was admitted as a member of the Royal College of Surgeons of England in 1838 and a licentiate of the Royal College of Physicians in 1850. He was also an anesthesiologist and designed a chloroform inhaler. He administered chloroform to Queen Victoria during the birth of two of her children.

During his times the miasma theory (or spontaneous generation theory), which stated that diseases were caused by organisms that arose spontaneously from bad air, swamps, and putrid matter, was the common way of thinking. The greatness of Snow's work was that he was able to apply epidemiologic methods to discern the germ origin of cholera without knowing that *Vibrio cholerae* was the causative agent of cholera.

In 1854 an epidemic of cholera occurred in London, centered in the area of Broad Street, Golden Square, Soho Square, and adjoining streets in London. In between Golden Square and Soho Square was the Broad Street pump. John Snow began mapping the deaths resulting from cholera and was able to find that most had occurred near the Broad Street pump. He was thus able to link cholera to the drinking water supplied from the Broad Street pump. When he removed the handle of the pump, the number of cases of cholera dramatically declined. This example illustrates one of the first applications of epidemiology and its impact on preventing the spread of disease.

In North America, Lemuel Shattuck (1793–1859), a lay health professional working for the Massachusetts Sanitary Commission, issued the *Report of a General Plan for the Promotion of Public and Personal Health* in 1850 (Lemuel Shattuck, 1959). This report, influenced by Chadwick's report, recommended the development of a state health department and local health boards in each town. The report recommended a decennial census; uniform nomenclature of disease and death; and data collection by age, gender, race, occupation, economic status, and locality. In addition sanitary inspections were to be conducted. Control of food and drugs, research on tuberculosis, immigrant health, supervision of mental diseases, control of alcoholism, control of smoke nuisances, construction of public baths and wash houses, the teaching of preventive medicine in schools, and other issues were presented in the report. Although Shattuck died within nine years of writing this report, some of the changes he recommended have shaped public health in the United States and have come to fruition in the present.

Modern Times

Bacteriologic Revolution

Modern times start with the late 19th century, when the bacteriologic revolution took place. In 1860 Louis Pasteur (1822–1895), a French chemist, provided evidence for the **germ theory of disease**, which stated that microorganisms were responsible for some diseases. Pasteur demonstrated that microorganisms were present in the air, but were not created by the air, an idea at immediate odds with the then-popular notion of spontaneous generation (Tan & Rogers, 2007). Pasteur is well known for the process of pasteurization, which entails boiling milk to prevent it from getting spoiled, and the discovery of vaccines for rabies and anthrax.

Where observation is concerned, chance favors only the prepared mind.

—Louis Pasteur, inaugural address to Lille Faculty of Science, December 7, 1854

Another well-known physician was Robert Koch (1843–1910), a German whose first contribution was detecting the etiology of anthrax in 1876 (Zetterstrom, 2006). In 1884 he discovered the etiology of cholera. He also discovered that pulmonary tuberculosis was caused by *Mycobacterium tuberculosis*, for which he was awarded the Nobel Prize in 1905. He is known for Koch's postulates, which state that in order to prove the causal relation between a microorganism and a disease, (1) the microorganism must be found in those suffering from the disease, (2) the microorganism must be isolated from the diseased organism and grown in pure culture, (3) the cultured microorganism must cause disease when introduced in a healthy organism, and (4) the microorganism must be reisolated from the inoculated host and must be identical to the original causative agent.

A British surgeon who contributed to the germ theory was Joseph Lister (1827–1912), who introduced the concept of antisepsis (Tan & Tasaki, 2007). He developed the use of phenol (carbolic acid) as an effective antiseptic. He would disinfect incisions with carbolic acid, as well as disinfecting the instruments and hands of the surgical team. He also pioneered the use of catgut suture in surgery, which is self-absorbed by the body.

The idea of collaboration between countries on matters of health originated during these times. The first International Sanitary Conference was convened in 1851 in Paris, with the participation of 11 European nations (Howard-Jones, 1974). The purpose of this conference was to institute some uniformity in quarantine measures, which varied from country to country. The conference lasted 6 months and prepared an international sanitary code with 137 articles. Unfortunately, this code never came into effect because it was ratified by only three countries. This conference was followed by

a series of conferences, which were also not able to reach a consensus on quarantine measures. In 1874 a proposal was made to establish a permanent International Commission on Epidemics, but it did not materialize immediately (Basch, 1999). The idea finally became reality in 1903 with the formation of the International Sanitary Bureau within the countries of the western hemisphere (later renamed the Pan American Sanitary Bureau in 1923). This was the world's first international health agency.

Another organization was set up in Paris in 1907: L'Office Internationale d'Hygiene Publique (OIHP), also known as the "Paris Office." The Paris Office was responsible for the administration of the international sanitary conventions and for collection and dissemination of data of public health importance to member states. The office was dissolved in 1946, and its epidemiologic functions were transferred to the World Health Organization in 1947.

World War I

Between 1914 and 1918, the world experienced a major war, called World War I or the Great War. The war was fought mainly in Europe, but because European countries had colonies all over the world, a large part of the world was involved. One of the parties to the war was the Entente Powers, comprising the United Kingdom and its colonies, France and its colonies, and Russia, and later joined by Italy and the United States. The other party was the Central Powers, comprising Germany, Austria-Hungary, the Ottoman Empire, and Bulgaria. The Netherlands, Spain, Switzerland, and the Scandinavian nations remained neutral. It is believed that over 40 million people died as a direct result of the war. Besides the negative effects of war, some demographers have argued that the war led to a drastic improvement in the living standards of the civilian population in Britain and Europe that would not have occurred if peace had prevailed (Winter, 1976, 1977).

War-torn countries were affected by several epidemics. More people died of epidemics than as a direct result of war. One of the most devastating pandemics of influenza occurred in 1918 and 1919. It is believed that between 50 and 100 million people died in that pandemic worldwide (White & Pagano, 2008). Most of the deaths occurred as a result of superadded bacterial infections because antibiotics were not yet available (Brundage & Shanks, 2007).

The League of Nations was created after the war in 1919. The primary purpose of the League was to prevent war, settle disputes between countries through negotiation, and improve worldwide welfare. In 1922, the League of Nations Health Committee and Health Section were formed in Geneva despite opposition and boycott by the United States (WHO, n.d). The Health Section acted as a link between national

health administrations and governments. It has been considered the most successful auxiliary of the League. In 1926 it started publication of the *Weekly Epidemiological Record*, which continues even to present times through the World Health Organization (Basch, 1999). It spread its activities all over the world. An Eastern Bureau of Epidemiological Information was set up in Singapore, a State Serum Institute was established in Copenhagen, and a National Institute for Medical Research was formed in London. Through these institutions vaccination programs for diphtheria, tetanus, and tuberculosis were launched all over the world.

World War I on the whole left most of Europe in turmoil. There was economic crisis, hyperinflation, and unemployment, which led to a major depression in the 1930s. Under such circumstances and with economic issues at the forefront, health issues were relegated to a much lower priority.

World War II

The League of Nations failed in its purpose to prevent wars; another major global conflict took place between 1939 and 1945, namely, World War II. The world was divided into two groups: Allied and Axis Powers. The United Kingdom and its colonies, the United States, and the Union of Soviet Socialist Republics were “The Big Three” of the Allied Powers; France and China were also part of the Allies. The three major Axis Powers were Nazi Germany, fascist Italy, and imperial Japan. Over 60 million people died in World War II, making it the deadliest war in human history (Dunnigan, 1996). More civilians died than soldiers. Civilian deaths occurred from explosions, firestorms, suffocation, vaporization, and starvation. The war’s direct cost in monetary terms was \$4 trillion (in terms of then-current dollars), making it the costliest war of all times (Richman, 1991). In terms of positive effects of the war, democracies were established in Germany, Italy, and Japan, and Nazi and fascist governments were removed. Another positive effect of the war was a rapid advancement in science and technology. Antibiotics were discovered during this period, which helped save millions of lives.

One of the after effects of the war was the formation of the United Nations. The name “United Nations” was coined in 1942 by U.S. President Franklin D. Roosevelt in a declaration wherein representatives of 26 nations pledged their governments to continue fighting together against the Axis Powers (United Nations, n.d.). After the war, representatives of 50 countries met at the United Nations Conference on International Organization in San Francisco to draw up the United Nations Charter. The United Nations officially came into existence on October 24, 1945, when the charter was ratified by China, France, the Soviet Union, the United Kingdom, the United States (the five nations with veto power), and a majority of other signatories.

Another postwar effect was the independence of European colonies, starting with India and Pakistan in 1947, Myanmar (Burma) and Sri Lanka in 1948, several African nations in the 1950s through 1970s, and finally Zimbabwe in 1980 and Namibia in 1990. All these newly independent nations became members of the United Nations.

The United Nations has developed many programs and organizations. We will turn to a discussion of some of these organizations along with other important international health organizations.

WORLD HEALTH ORGANIZATION

Within the United Nations, the World Health Organization (WHO) is the directing and coordinating authority for health. Its constitution came into effect on April 7, 1948, which is celebrated as World Health Day. Work on the constitution began in 1946 when the Economic and Social Council of the United Nations established a Technical Preparatory Committee of Experts (Grad, 2002). WHO subsumed the functions of the League of Nations Health Committee and Health Section and L'Office Internationale d'Hygiene Publique in Paris.

Agenda

WHO has a six-point agenda:

1. Promoting development by working with poor, disadvantaged, and vulnerable groups
2. Fostering health security by fighting against outbreaks of emerging and epidemic-prone diseases
3. Strengthening health systems by providing for trained staff, sufficient financing, suitable systems for collecting vital statistics, and access to appropriate technology, including essential drugs
4. Harnessing research, information, and evidence by setting priorities, defining strategies, and measuring results
5. Enhancing partnerships between UN agencies, other international organizations, donors, civil society, and the private sector
6. Improving performance in terms of efficiency and effectiveness, both at the international level and within countries

Structure

The headquarters of the World Health Organization are in Geneva, Switzerland, and there are six regional offices (**Table 1.2**).

TABLE 1.2 Regional Offices of the World Health Organization

Region	City	Web Site
WHO African Region	Brazzaville, Congo	www.afro.who.int/
WHO Region of the Americas/Pan American Health Organization	Washington, DC, USA	www.paho.org/
WHO Eastern Mediterranean Region	Cairo, Egypt	www.emro.who.int/index.asp
WHO European Region	Copenhagen, Denmark	www.euro.who.int/
WHO South-East Asia Region	New Delhi, India	www.who.int/about/regions/searo/en/index.html
WHO Western Pacific Region	Manila, Philippines	www.wpro.who.int/

Governance

The World Health Assembly, comprising 193 member states, is the supreme decision-making body of WHO. The World Health Assembly appoints the director-general who heads the organization. The assembly also oversees the financial policies of the organization, including approval of the budget, and directs the executive board to take up matters for action, study, or investigation. The executive board is composed of 34 members who are technically qualified in the field of health. The Secretariat of the World Health Organization is staffed by approximately 8000 health and other experts and support staff who are on fixed-term appointments. They are based at the headquarters, at the six regional offices, and in different countries. Membership in WHO is open to all countries that are members of the United Nations and accept the WHO constitution. The proposed program budget for 2008–2009 was \$4.22 million (WHO, 2007).

Functions

The functions of WHO are described in Article 2 of its constitution:

- (a) To act as the directing and coordinating authority on international health work
- (b) To establish and maintain effective collaboration with the United Nations, specialized agencies, governmental health administrations, professional groups, and such other organizations as may be deemed appropriate

- (c) To assist governments, upon request, in strengthening health services
- (d) To furnish appropriate technical assistance and, in emergencies, necessary aid upon the request or acceptance of governments
- (e) To provide or assist in providing, upon the request of the United Nations, health services and facilities to special groups, such as the peoples of trust territories
- (f) To establish and maintain such administrative and technical services as may be required, including epidemiological and statistical services
- (g) To stimulate and advance work to eradicate epidemic, endemic, and other diseases
- (h) To promote, in co-operation with other specialized agencies where necessary, the prevention of accidental injuries
- (i) To promote, in co-operation with other specialized agencies where necessary, the improvement of nutrition, housing, sanitation, recreation, economic or working conditions, and other aspects of environmental hygiene
- (j) To promote co-operation among scientific and professional groups that contribute to the advancement of health
- (k) To propose conventions, agreements and regulations, and make recommendations with respect to international health matters, and to perform such duties as may be assigned thereby by the organization and are consistent with its objective
- (l) To promote maternal and child health and welfare, and to foster the ability to live harmoniously in a changing total environment
- (m) To foster activities in the field of mental health, especially those affecting the harmony of human relations
- (n) To promote and conduct research in the field of health
- (o) To promote improved standards of teaching and training in the health, medical, and related professions
- (p) To study and report on, in co-operation with other specialized agencies where necessary, administrative and social techniques affecting public health and medical care from preventive and curative points of view, including hospital services and social security
- (q) To provide information, counsel, and assistance in the field of health
- (r) To assist in developing an informed public opinion among all peoples on matters of health
- (s) To establish and revise, as necessary, international nomenclatures of diseases, of causes of death, and of public health practices
- (t) To standardize diagnostic procedures as necessary
- (u) To develop, establish, and promote international standards with respect to food, biological, pharmaceutical and similar products
- (v) Generally, to take all necessary action to attain the objective of the organization

TABLE 1.3 Focus of World Health Reports, 1995–2008

Year	Focus
1995	Bridging gaps between rich and poor and between those with and without access to health care around the world
1996	Strategies for combating infectious diseases
1997	Strategies for combating noncommunicable diseases
1998	Examination of trends over the past five decades and projection of how life would be until 2025
1999	Achievements of the 20th century and the problems that would be carried over in the 21st century
2000	Examination and comparison of health systems around the world
2001	Strategies for dealing with mental health
2002	Reducing risks and promoting healthy life
2003	Examination of the global health situation and the major threats to health in the world
2004	HIV/AIDS and its comprehensive strategy, involving prevention, treatment, care, and long-term support
2005	Maternal and child health
2006	Assessment of the health care workforce around the world
2007	Threats to public health security all over the world
2008	Individual health security and the role of primary health care and humanitarian action

Source: World Health Organization, <http://www.who.int/whr/previous/en/index.html>

World Health Reports

Every year WHO publishes a World Health Report. **Table 1.3** summarizes the focus of these reports from 1995 to 2008.

OTHER HEALTH-RELATED UNITED NATIONS AGENCIES

UNICEF

After World War II, children in Europe faced famine and disease. To provide food, clothing, and health care to them, the United Nations created the United Nations

FOCUS FEATURE 1.2 Primary Health Care

In 1978, the World Health Organization organized an international conference on **primary health care** in Alma Ata, in what was then the Soviet Union. The end result of the conference was the Declaration of Alma Ata (WHO, 1978). The declaration had ten clauses. The first clause affirmed that health was the right of all citizens of the world. The second clause declared that inequity existed between developed and developing countries in health status and that it was unacceptable. The third clause identified social and economic development as central to bridging the gap between developed and developing nations. The fourth clause affirmed individual and collective responsibility in planning and implementing health care. The fifth clause identified governmental responsibility and the role of primary health care.

The sixth clause defined primary health care as “essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self reliance and self-determination.” The seventh clause defined the attributes of primary health care as follows: (1) being based on social, biomedical, and health services research; (2) providing promotive, preventive, curative, and rehabilitative services; (3) including education about health problems, promotion of food supply and proper nutrition, adequate supply of safe water and basic sanitation, maternal and child health, family planning, immunizations, prevention of locally endemic diseases, appropriate treatment of common diseases and injuries, and provision of essential drugs; (4) being multisectoral, involving agriculture, animal husbandry, education, food, industry, housing, public works, communication, and so on; (5) involving individual and community participation; (6) having effective referral systems; and (7) utilizing a health team of physicians, nurses, auxiliaries, community workers, and midwives.

The eighth clause asked governments to formulate national policies to build an infrastructure for primary health care. The ninth clause asked for mutual cooperation between nations. The final clause urged the devotion of more resources for the health sector, with transference from current military spending.

Since the Declaration of Alma Ata many developing nations have embraced this philosophy and have made strides in improving the health of their citizens. The Declaration of Alma Ata wanted this to be a reality for all by 2000. However, that has not happened.

International Children’s Emergency Fund (UNICEF) in December 1946. In 1953, when the program’s emergency functions were over, the General Assembly extended its mandate indefinitely and renamed it the United Nations Children’s Fund while retaining its acronym. In 1965 it was given the Nobel Peace Prize. The chief activities of UNICEF pertain to child survival and development; basic education and gender equality; HIV/AIDS and children (prevention of pediatric HIV/AIDS and care of orphaned children); child protection from violence, exploitation, and abuse; and policy advocacy and partnerships.

United Nations Development Program

The United Nations Development Program (UNDP) is responsible for a development-related network. It has offices in 166 countries, where it aims at building local capacity. It helps countries attract and use aid effectively. It is working toward achievement of the Millennium Development Goals by 2015: eradication of extreme poverty and hunger; achievement of universal primary education; promotion of gender equality and empowerment of women; reduction of childhood mortality; improvement in maternal health; combating HIV/AIDS, malaria, and other diseases; ensuring environmental sustainability; and developing a global partnership for development. The headquarter of UNDP is in New York, and it has liaison offices in Geneva (Switzerland), Brussels (Belgium), Copenhagen (Denmark), Tokyo (Japan), and Washington, DC (United States).

United Nations Population Fund

The United Nations Fund for Population Activities (UNFPA) began in 1969 as part of the UNDP and gradually became a separate entity. In 1987 its name was changed to the United Nations Population Fund, but its original acronym was retained. Its mission is to “promote the right of every woman, man and child to enjoy a life of health and equal opportunity. UNFPA supports countries in using population data for policies and programmes to reduce poverty and to ensure that every pregnancy is wanted, every birth is safe, every young person is free of HIV/AIDS, and every girl and woman is treated with dignity and respect” (United Nations Population Fund, n.d.).

Food and Agriculture Organization

The Food and Agriculture Organization (FAO) was formed in 1945 and has its headquarters in Rome. The FAO’s mandate is “to raise levels of nutrition, improve agricultural productivity, better the lives of rural populations and contribute to the growth of the world economy” (FAO, n.d.). The FAO provides assistance such as the introduction of simple, sustainable tools and techniques to increase crop production in communities, relief in times of drought, and other such measures geared toward ensuring food security for all people of the world. The FAO budget for the biennium 2008–2009 was \$929.8 million.

World Food Program

The World Food Program (WFP) is the United Nations’ specialized agency with a mission to combat global hunger. According to some estimates, the problem of hunger

affects one of every seven people in the world. The WFP was initially started as a 3-year experimental program in 1961 by the FAO, but has continued since then. It deals with both emergency relief and development efforts. In 2006, the WFP fed 87.8 million people in 78 countries.

United Nations Environment Program

The United Nations Environment Program (UNEP) is the United Nations agency for addressing environmental issues at the global and regional level. Its headquarters are in Nairobi, Kenya. The mission of UNEP is “to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations” (UNEP, n.d.). The UNEP Governing Council has 58 members, who are elected by the UN General Assembly for 4 years. Some of the activities of UNEP include the following: evaluating global, regional and national environmental conditions; establishing international agreements and national environmental measures; consolidating institutions for the effective management of the environment; strengthening economic development and environmental protection; fostering transfer of knowledge and technology for sustainable development; and building new partnerships within society and the private sector.

United Nations High Commission for Refugees

The United Nations High Commission for Refugees (UNHCR) was established on December 14, 1950, by the United Nations General Assembly. Its mission is to lead and coordinate international action to protect refugees and resolve refugee problems all over the world. Its fundamental purpose is to safeguard the rights and well-being of refugees.

International Labor Organization

The International Labor Organization (ILO) was originally established in 1919 and then became the first specialized UN agency in 1946. The ILO’s main aims are “to promote rights at work, encourage decent employment opportunities, enhance social protection and strengthen dialogue in handling work-related issues” (ILO, n.d.). ILO’s activities are categorized under four objectives: (1) to promote and realize standards and fundamental principles and rights at work, (2) to create greater opportunities for women and men to secure decent employment and income, (3) to enhance the

coverage and effectiveness of social protection for all, and (4) to strengthen cooperation and social dialogue.

United Nations Educational, Scientific, and Cultural Organization

The United Nations Educational, Scientific and Cultural Organization (UNESCO) was established on November 16, 1945. In the field of education, it promotes basic education for all, secondary education (including technical and vocational education), and higher education. In the field of natural sciences, it develops programs to assess and manage the Earth's resources and builds the capacities of developing countries in the sciences, engineering, and technology. In the field of social and human sciences, it helps to understand and interpret the social, cultural, and economic environment. In the field of culture, it helps in preserving and respecting the specificity of each culture. In the field of communication and information, it promotes sharing of knowledge and incorporating all the sociocultural and ethical dimensions of sustainable development.

ADDITIONAL HEALTH-RELATED INTERNATIONAL ORGANIZATIONS

Rockefeller Foundation

The Rockefeller Foundation was created in 1913 by John D. Rockefeller Sr. to promote the well-being of people around the world. In the early years it was mainly active in the area of public health and medical education. The foundation gives grants for projects that primarily focus on poor and vulnerable sections of the world. The major areas where the foundation has funded projects include global health, innovation for development, agricultural productivity, economic resilience, and urban life. It has assets of over \$3.5 billion, making it a very powerful organization.

Ford Foundation

The Ford Foundation was created in 1936 through an initial gift of \$25,000 from Edsel Ford, son of Henry Ford, the founder of the Ford Motor Company. The mission of the Ford Foundation is fourfold: (1) to strengthen democratic values, (2) to reduce poverty and injustice, (3) to promote international cooperation, and (4) to advance human achievement. The Ford Foundation supports programs in asset building and community development, peace and social justice, and knowledge, creativity, and

freedom. It has funded projects in arts and culture, civil society, community development, development finance and economic security, education and scholarship, environment and development, governance, HIV/AIDS, human rights, media, religion, society and culture, sexuality and reproductive health, and workforce development.

CARE

CARE was created in 1946 as the Cooperative of American Remittances to Europe for the purpose of sending food from American donors to war-distressed Europe. Today the acronym stands for Cooperative for Assistance and Relief Everywhere, Inc. The present mission of this organization is to serve individuals and communities struggling with poverty. The organization has a five-pronged strategy comprising the following: (1) capacity building for self-help, (2) provision of economic opportunity, (3) providing relief in emergencies, (4) influencing policy decisions at all levels, and (5) eliminating discrimination at all levels. It has projects in 69 countries around the world. CARE USA's budget in 2006 was more than \$589 million.

International Red Cross

The International Red Cross is one of the world's largest humanitarian organizations and has national offices in 186 countries. It includes the Geneva-based International Committee of the Red Cross (ICRC) and the International Federation of Red Cross and Red Crescent Societies (the International Federation). The mission of the International Committee of the Red Cross is "to protect the lives and dignity of victims of war and internal violence and to provide them with assistance" (ICRC, n.d.). The origin of this organization dates back to the Battle of Solferino in 1859, when a Swiss businessman, Henry Dunant, was appalled by the suffering of injured soldiers on both sides; he helped the soldiers and conceived the idea of the organization.

United States Agency for International Development

In 1961, the United States Agency for International Development (USAID) was created by President John F. Kennedy to provide economic development and humanitarian assistance programs all over the world in support of the foreign policy goals of the United States. It is free from political and military functions; its purpose is mainly to help developing countries. Its headquarters are in Washington, DC, but there are several field offices around the world. USAID works in agriculture, democracy and governance, economic growth, the environment, education, health, global partnerships, and

humanitarian assistance in more than 100 countries. Within the health field, USAID projects have been in the areas of environmental health, family planning, health systems, HIV/AIDS, infectious diseases, maternal and child health, and nutrition.

SKILL-BUILDING ACTIVITY

What kinds of careers are available in international health? To get a glimpse, visit the following sites:

- World Health Organization employment site (<http://www.who.int/employment/en/>)
- USAID careers site (<http://www.usaid.gov/careers/>)
- UNICEF careers site (<http://www.unicef.org/about/employ/index.html>)
- Peace Corps volunteers (<http://www.peacecorps.gov/index.cfm>)

What kinds of jobs interested you? Which country would you like to work for? Did any jobs look like dream jobs for you? What kinds of skill sets were required for those jobs? How can you shape your education to be able to fulfill those skill sets? Were there any internship or volunteer opportunities that appealed to you that will help you prepare for future jobs?

SUMMARY

Health can be defined as a means to achieve desirable goals in life while maintaining a multidimensional (physical, mental, social, political, economic, and spiritual) equilibrium that is operationalized for individuals as well as for communities. Medicine and public health are two disciplines that have shaped international health. Public health deals with disease prevention and health promotion through organized community effort, whereas medicine is about diagnosing and treating diseases. *International health* is defined as the science and art of examining health problems in multiple countries, primarily those that are developing, and finding population-based solutions to their problems. *Global health* is the study of health problems and solutions affecting all people of the world.

Among the oldest civilizations in the world are the Indus Valley civilization (3500–1500 BCE) and the Vedic civilization (2000–600 BCE) in India, which have given Ayurveda and yoga to the world. The ancient civilization in Mesopotamia (6000–400 BCE) is known for the Codex Hammurabi, the first set of written laws, including rules for health care. Ancient civilization in Egypt (3000–300 BCE) is known for medical texts on papyrus and for advancements in water and sanitation. Ancient civilization in China is credited with developing the Chinese system of medicine based on *qi*, *yang*, and *yin*.

Medicine the way it is practiced today can trace its roots to the fifth century BCE, when Hippocrates introduced a rational way of treating diseases. Galen (130–205 CE) was a well-known physician and medical teacher of the Roman civilization who contributed to the advancement of techniques in medicine. During the Middle Ages (500–1500 CE), the Arabs originated a system of medicine called the *Unani system* and had physicians such as Rhazes (865–925 CE) and Avicenna (980–1037 CE). Mayans, Incas, and Aztecs in Central and South America also had well-developed systems of medicine and public health. The Middle Ages in Europe paved the way for a cultural movement called the Renaissance (1420–1630), in which a revival of science, art, and culture occurred.

In 1842 Edwin Chadwick published a report on the sanitary conditions of the laboring population in Britain that led to the first public health legislation, the Public Health Act of 1848. John Snow in 1854 linked cholera to contaminated water, which led to prevention of the disease's transmission. Around the same time, Lemuel Shattuck wrote a public health report in Massachusetts, United States. In the late 19th century a bacteriologic revolution took place.

The period after World War I was marked by establishment of the League of Nations, the first entity designed for the collective action of nations. The period after World War II led to formation of the United Nations and the World Health Organization, along with several United Nations agencies related to health. Other international agencies working in the health sector include the Rockefeller Foundation, Ford Foundation, CARE, the International Red Cross, and USAID.

IMPORTANT TERMS

Ayurveda	prehistoric period
Codex Hammurabi	primary health care
Corpus Hippocraticum	public health
Ebers papyrus	<i>qi</i>
Edwin Smith papyrus	Taoism
germ theory of disease	theory of contagion
global health	<i>ticiotl</i>
health	<i>tridosha</i> theory of disease
historic period	<i>Unani</i> system
international health	<i>yang</i>
Kahun papyrus	<i>yin</i>
medical model	yoga
Middle Ages	

REVIEW QUESTIONS

1. Define international health. Differentiate it from global health.
2. Differentiate between medicine and public health.
3. Describe common issues in international health.
4. Discuss the contributions of the ancient civilizations of India to international health.
5. Explain the contributions of Greco-Roman civilization to international health.
6. Compare and contrast the Arabian *Unani* system of medicine with the Aztec *ticiotl* system.
7. Explicate the contributions of Edwin Chadwick and Lemuel Shattuck in their respective countries.
8. Summarize the key functions of the World Health Organization.

WEB SITES TO EXPLORE

Ancient Indus Civilization

<http://www.harappa.com/har/har0.html>

This Web site contains 1144 illustrated pages by leading scholars of ancient India and Pakistan and the ancient Indus Valley civilization. It has slides of recent excavations of these sites and provides a glimpse into the culture. *Explore this Web site and comment on public health structures found in the pictures from this Web site.*

John Snow

<http://www.ph.ucla.edu/epi/snow.html>

This Web site was developed by the Department of Epidemiology at the University of California, Los Angeles, in honor of John Snow (1813–1858). It has animated slide shows about the life and contributions of John Snow. Very detailed accounts can be obtained at this Web site. *Explore this Web site and watch and listen to the slide shows about John Snow. What did you learn?*

Rockefeller Foundation

<http://www.rockfound.org/>

The home page provides information about the Rockefeller Foundation's activities and news. From the home page one can link up to initiatives, other efforts, grants and ideas, and a library. Accounts about various initiatives of the foundation can be found, which make interesting reading. *Explore this Web site. In the Grants section, make a search for grants given out by the foundation on a topic of interest to you.*

UNICEF

<http://www.unicef.org/>

The official Web site of UNICEF provides information by country. It also has tabs about what UNICEF is, why it does what it does, people associated with UNICEF, voices of youth, its AIDS campaign, the Annual Report on the State of the World's Children, a press center, videos, and a newsletter sign-up. *Explore this Web site and read the most recent report on the state of the world's children. What were the salient points in this report?*

USAID

<http://www.usaid.gov/>

This Web site contains links explaining the kind and location of projects and activities done by USAID, as well as its policy, public affairs, business, and careers. *Visit this Web site and focus on careers. Did you find a career that interests you?*

World Health Organization

<http://www.who.int/en/>

The World Health Organization (WHO) was established in 1948 as a specialized United Nations Agency for health. The Web site contains information about WHO, its member countries, its publications, data and statistics, and programs and projects. The Web site also has links to information about international travel and the annual World Health Report. *Explore this Web site and read the latest World Health Report. What were the salient points in this report?*

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